UNION OF SOUTH AFRICA

ANNUAL REPORT

OF THE

Department of Public Health

YEAR ENDED 30th JUNE, 1935

PUBLISHED BY AUTHORITY

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DEPARTMENT OF PUBLIC HEALTH.

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To the Honourable the Minister of Public Health.

I have the honour to submit herewith the Report of the Department of Public Health for the year ended 30th June, 1935.

I.—INTRODUCTORY.

Provincial Finance Commission.—In the last annual report of the Department reference was made to the difficulties created by the division of public health functions and responsibilities between the Union Government and the Provincial Administrations; it was pointed out that these difficulties, as well as the need for a simpler and better co-ordinated organisation for administering and dealing on a broad national basis with local government, school medical matters, sanitation, housing, hospitals and the midwifery and nursing needs of the people, had been clearly placed by the Department before the Provincial Finance Commission.

The Commission in due course reported. It recognised and indeed emphasised the difficulties created by the constitutional position, but it did not make any really constructive proposals for their remedy.

Administrative and Legislative Adjustments.—At the subsequent conference between the Government and Executive Committees of the several Provinces to consider the report, a readjustment of public health policy on certain lines was agreed to, which it was thought would be likely to lead to an improvement in an admittedly unsatisfactory position. Some of these readjustments required legislative sanction. The Public Health (Amendment) Act, 1935 (Act No. 57 of 1935) was, therefore, introduced into and passed by Parliament to give effect to them and was proclaimed by the Governor-General to come into force on the 1st July, 1935.

Under section 4 of this Act, whenever the Minister is satisfied that a local authority is unable to deal properly with a public health problem owing to lack of resources, he is enabled after consultation with the Administrator to transfer the dealing with the problem to the magistrate or to the divisional council and may authorise the Administrator to assess up to 25 per cent. of the total expenditure what that local authority should pay. This provision in the law will at least enable a small village management board with a tiny income to be relieved from dealing with, for instance, a severe outbreak of plague, the cost of which, in spite of the liberal refunds allowed under the Public Health Act, it would be quite unable to defray in the ordinary way.

The most important perhaps of the various amendments agreed to are those contained in sections 5 and 6 of the new Act, which enables the Minister, on the certificate of a medical practitioner and where a local authority fails to supply treatment to a person suffering from an infectious, communicable or preventable disease and urgently in need of treatment, to take any steps that he may deem necessary to provide the appropriate treatment and to recover through the Administrator the proportion of the cost that would be payable in the ordinary way by the local authority which, for one reason or another, has failed to deal wtih the patient. Another very important amendment which was recommended by the Commission makes the cost of dealing with tuberculosis the responsibility of the State, the Provincial Administration and the local authority in the proportion of 50 per cent., 25 per cent., and 25 per cent. respectively.

Division of Responsibilities for District Nursing.—The Provincial Finance Commission gave no clear lead in regard to district nursing and midwifery services; but at the conference between Ministers and the Executive Committees of the Provinces above referred to the latter agreed to accept full responsibility for the training of nurses and midwives for the needs of the country in Provincial and Provincial-aided hospitals, while the Union Government undertook to subsidise district nursing and midwifery services.

It was considered generally that in large urban areas these services could be rendered most efficiently by the responsible hospital authorities and the Union Government undertook to refund to the Provincial Administrations a proportion of any expenditure they might incur either directly or in granting subsidies to hospital boards for such services. In other areas it was

decided that the Union Government should assume direct responsibility for assisting charitable organisations and local authorities to establish these services.

This is provided for by section 13 of the Public Health (Amendment) Act, under which the Department is now able to refund one-half of the expenditure incurred by a Provincial Administration on district nursing or midwifery services connected with one of its hospitals or in subsidising a hospital board for such services. Under section 14, the Department is authorised to refund in other areas one-third of the salaries of any certificated nurse or midwife employed by a charitable institution or a local authority or to subsidise certificated nurses or midwives in private practice in any area so as to retain them in practice in such area; further, under section 15, similar authority is given to the Department to assist to the same extent in native areas, and refunds can now be made on the salaries of any certificated nurse or midwife or uncertificated native nursing assistant employed by any charitable organisation or any body controlling any mission hospital or any statutory native body which makes provision for such a service or, alternatively, the Department may similarly subsidise private nurses and midwives and native nursing assistants engaged in private practice or it may appoint and employ itself nurses and medical and nursing assistants to undertake district work in such areas.

Provincial Consultative Committees.—The Public Health (Amendment) Act, 1935, which came into force on the 1st July, will, it is believed, do much to make the public health law of South Africa more flexible; moreover, the establishment of the Provincial Consultative Committee to meet at regular intervals, which was also agreed to at the conference referred to above, should, it is felt, be able to achieve results in public health which have not been possible in the past. By means of sub-committees of Union and Provincial officers, proposals can be formulated with the approval of all concerned for the consideration of the Committee. Short of a radical alteration in the constitutional position which, of course, is not the policy of the Government, it is believed that decisions taken at meetings of the Provincial Consultative Committee, after frank discussions amongst responsible officers, will go a long way towards overcoming the difficulties created by the Act of Union in the administration of public health in South Africa. I think that from a public health point of view alone the establishment of the Provincial Consultative Committee may be fairly claimed as an outstanding achievement.

Other Legislation.—Apart from the passing of the Public Health (Amendment) Act, No. 57 of 1935, the Department was successful during the year in securing the passage through Parliament of two other important measures.

One of these was a Bill to give effect to the International Convention for the Sanitary Control of Aerial Navigation, to which the Union of South Africa has adhered. This Bill was promulgated as Act No. 7 of 1935, and took effect as from the 15th June, 1935. Regulations under the Act were promulgated and the Rand Air Port and the aerodrome at Walvis Bay were duly proclaimed under the Act to be sanitary aerodromes for the Union within the meaning of the Convention.

Important amendments of the Medical, Dental and Pharmacy Act were also obtained by the passage through Parliament of an amending Bill which was duly promulgated as Act No. 2 of 1935. By the latter, certain difficulties which had arisen in connection with the working of the principal Act were removed and the procedure for dealing with minor disciplinary cases by the Medical Council and the Pharmacy Board was greatly simplified. The promulgation of this Act should mean a substantial annual saving in the expenditure of the Medical Council and, to a less extent, in that of the Pharmacy Board.

The Return of Prosperity.—The health year for which this report has been compiled, has probably been in some respects the most prosperous in the history of South Africa. An overflowing exchequer and globular surpluses in the national and railway budgets are the outcome of an amazing increase in the volume of trade witnessed during the period.

This has resulted almost entirely from the continued rapid expansion of the gold mining industry, where the number of European employees on the mines at the end of December, 1934, was 30,175, or 3,384 more than at the same date in 1933, and the number of natives at the end of 1934 was 252,036, an increase of 16,297 over the number at the end of 1933. Although the results of this expansion are mainly to be seen in the Witwatersrand, no part of the Union, urban or rural, has failed to share in its effects. An indication of this is to be seen in the building industry. In Johannesburg itself, and in neighbouring municipalities, old buildings which have been looked upon almost as landmarks are rapidly disappearing and their places are being taken by new commercial buildings and by blocks of flats. In

1933, plans to the value of £1,883,861 were approved by the Johannesburg Town Council. In 1934, this was exceeded by 300 per cent., and new buildings and dwellings were put in hand to a record total value of nearly six millions of money.

Most other cities and towns in the Union have experienced similar conditions though naturally to a less extent. Kimberley, depending as it does almost entirely upon the diamond mines, with the continued depression in the diamond market has been a striking exception to the general rule.

It is clear that South Africa has made a complete recovery in its commerce and manufacturing industries from the recent depression and that the trade barometer is set fair and is likely to remain so unless for any reason there should be a substantial fall in the price of gold. The same, unfortunately, is not the case as affecting agricultural and allied occupations. Primary producers are still harassed by dislocated markets and the low levels to which world prices have fallen. They have been kept going by subsidies and other forms of State relief; without this there would have been widespread distress and a hastening of the already dangerous drift of the European population from country to town with all that that entails in overcrowding and in the struggle of Europeans for an existence in competition with non-Europeans in the unskilled labour market.

The Effect of Poverty on Health.—It has often been stated that poverty is the chief cause of the greater part of the illness which affects a community. In England it has been shown that there are very striking differences between the death rate of the well-to-do and those of the poorest class. For example, 51 per 100,000 for the well-to-do in tuberculosis, 137 for the poor; external cancer, 58 as against 140; heart disease, 57 as against 128; pneumonia, 83 as against 150; and so on. It is true that there are a few classes of disease in which the position is reversed, but they are very few. In a careful inquiry made recently into the sickness and death rates of families in Baltimore in the United States of America, it was shown that if all the children in all the families could have been placed on the same economic position as those best off, 72 per cent. of the deaths could have been avoided.

No similar inquiries have hitherto been possible in South Africa, but in the interesting report of the Medical Officer of Health for the City of Capetown for the year 1930-1931, quinquennial statistics for the five years ended the 30th June, 1931, are given. These indicate also the influence of social and economic conditions on the death rates of different sections of the community. Thus the general death rate in non-Europeans was 2·4 times as great as in Europeans, the infant mortality rate 2·7 times, and the tuberculosis rate 6·1 times. That this was not due to racial causes alone is seen by the fact that similar differences appeared when the rates for the European population of the different wards were compared. The four wards with the lowest European mortality rates in the quinquennium were the relatively well-to-do wards of Kalk Bay, Sea Point, Park, and Kloof, and the four highest, the poorer wards, namely, the Castle, Harbour, West Central, and Woodstock. The European general death rate in the latter ward was 1·7 times as great as in the former, the European infant mortality 1·8 times and the European tuberculosis death rate 3·0 times.

We know, of course, that in the case of Europeans the number of deaths registered in urban areas is always largely in excess of the number registered in rural areas. This is mainly owing to the fact that the urban European population represents roughly 61 per cent. of the total European population of the Union and also that the deaths of many rural inhabitants occur in the larger towns, especially within hospitals and private institutions. From the 1st January, 1924, the latter factor has been corrected, and the tabulation of death statistics in the Census office has been done by area of residence. A perusal of the returns show that the urban rate is consistently higher than the rural rate. This may be attributed in part to the more hazardous occupation followed by the urban industrial population and in part to the large number of old people and invalids who change their residence from rural to urban areas to be within easy reach of medical and nursing aid.

Unfortunately, it is not possible, owing to the absence of compulsory notification of non-European births and deaths in rural areas in South Africa, to show whether the return to prosperity generally in South Africa has brought with it any general improvement in the health of the people as a whole. Nor is it possible for the same reason even to form more than a general impression as to the state of the public health in the rural areas of South Africa. As I have already stated, the measures taken by the Government in connection with agricultural relief have to a large extent kept people on the land, but much of the expenditure in this connection has not really benefitted the poorer classes and there is still much poverty and distress in the rural areas. Further, the wages paid in most districts to agricultural labourers are at such a low level that it is almost impossible for them to rear healthy families. Moreover, the housing conditions

generally of such labourers, except where they come under Government control, are deplorable. As a direct consequence it may be said, without fear of contradiction, that the power to resist disease particularly amongst the poorer Europeans and the non-European farm labourer is generally low indeed. This was clearly demonstrated by the typhus outbreak which reached its peak in the Orange Free State and adjoining districts in the winter of 1934.

Housing.—While the housing conditions of the poor in rural areas are generally very bad and are not capable generally of being substantially improved under existing legislation, the passing of the Slums Act, 1934, will mark, it is hoped, the opening of a new chapter in the campaign for better housing in urban areas which had been sorely lagging during the recent period of acute depression.

Until the Great War, there had been no real consciousness in our urban areas of an acute housing shortage. During the war years, however, domestic building of all kinds was virtually at a standstill. The population as a whole continued to increase. At the call of war work, numbers of people moved from one part of the country to another and particularly from the country to the large towns, while many went overseas, and after the war demobilisation resulted in large numbers of men arriving back to a housing situation which had adapted itself to their absence. No new houses, however, were available to meet the demand due to natural increase, migration and demobilisation. Further, during the war large numbers of dwellings had deteriorated rapidly into slum or semi-slum conditions and, unrelieved by new buildings, overcrowding had increased by leaps and bounds.

A Government Committee, appointed in 1919 to consider the matter, reported that, without taking into consideration dilapidated houses or allowing for any increase in population, there was in the larger towns in the Union a shortage of 4,400 of three, four, and five roomed houses suitable for clerks, artisans, and shop assistants, a shortage of 5,650 two, three, and four-roomed houses suitable for the poorer white and better-class coloured people, and a shortage of 11,400 dwellings for natives and poorer coloured people. This was undoubtedly an underestimate for the large towns. As a result of the findings of the committee, the Housing Act, 1920, was passed.

Up to 30th June, 1935, the following accommodation has been provided under the Act:—

	Dwellings.	
	European.	Non-European.
By Economic Loans.....	4,602	8,817
By Sub-economic Loans.....	725	835
Total.....	5,327	9,652

Practically no housing has been provided for the poorer classes since the war by private enterprise and, as will be seen, the cottage building for the poorer classes and location housing undertaken by local authority enterprise out of Government Loans has not even met the shortage disclosed by the 1929 Committee. Such building as had been undertaken was quite insufficient even to meet the natural increase in the population.

Apart from this, the main housing problem in urban areas to-day needs to be assessed on standards other than those based merely on numerical shortage. There is the question of houses unfit for human occupation and of houses overcrowded with inmates. The post-war effort in the large towns of South Africa had almost entirely failed to clear away old worn-out houses, however intolerable their condition, and it had largely failed to abate the overcrowding which such old property has persistently attracted. It was assumed when the Housing Act was passed in 1920, that slum conditions and overcrowding would give way to the indirect attack of new dwellings, that the slum population would in process of time filter up out of slum dwellings by the superior attractions of the new houses. This undoubtedly did occur to some extent, but it soon ceased: the attractions were not sufficient, the pool of new houses was not large enough, rents and additional travelling costs were too high, and, in the last few years, during which there has been a further large influx into the towns from the rural areas, economic depression and unemployment have produced in all classes of the population a " filtering down " to smaller and cheaper units of occupation at least equal to any " filtering up " movement.

Slums.—A recent writer has stated that slums are impossible without slum dwellers and that slums and slum population grow together. Which is cause and which effect is a matter of endless and, perhaps, fruitless debate. The important and certain fact is that a typically slum-dwelling class is the first and commonest characteristics of the slums and that its existence tends to perpetuate them. Poverty and ignorance in the inhabitants of slums constitute a strong combination to resist a national effort to abolish slum conditions. To say that slum dwellers will create fresh slums wherever they are moved is not true. If rehoused in good, healthy surroundings such as those for whom the Cape Utility Company is responsible for at Maitland, the vast majority of families displaced from slums can quickly be trained to appreciate and maintain a satisfctory standard. A not inconsiderable proportion are slum dwellers owing to adversity and need no training. Only a minority will teud to degrade into slums any dwellings however good to which they may be moved. But experience in other couutries has shown that if specific rehousing and proper supervision do not accompany clearance, this minority may easily become a majority which, driven from one slum will create or intensify another slum next door. This has indeed been strikingly illustrated recently in Johannesburg. At bottom, slums are a problem of poverty which housing effort alone cannot solve finally and completely.

The same writer also points out that from poverty springs a second characteristic of nearly all slums, " overcrowding ", i.e. excessively large numbers of persons living per room or per house. As already noted " overcrowding " extends to large numbers of houses above the slum and semi-slum classes. But there is a strong tendency for overcrowding property to deteriorate to the slum level. Some overcrowding is due to ignorance, apathy and a primitive tendency to herd together as closely as possible, some is due to a desire to save money or to use it in other ways rather than for adequate house-space, and some to deficiency or excessive cost of transport. A great deal of overcrowding during and after the war was due to the sheer house shortage; but at the present time the vast mass of overcrowding arises from inability to afford the extra rent of more rooms, and from the frequent sharing of rents by two or more families crowding together in dwellings only equipped for and large enough for one.

A great deal of the worst overcrowding, especially that due to sub-tenanting and other arrangements for the sharing of dwellings, is only made possible by a third characteristic of slums—bad or inefficient management. I do not think that it can be said that South Africa has as yet produced a special type of slum-landlord. Every size of holding, every type of tenure, every quality from the most extortionate to the most charitable, is to be found. Sometimes the inefficiency which allows slum conditions to develop is a legacy of the past which efficiency struggles in vain to remedy. Sometimes owners by inheritance or trust know nothing of the nature of the property which their agents administer; sometimes owners have granted long leases which leave them no power to interfere; sometimes slums have been created by outside forces entirely beyond the owners' control. High costs and the impossibility of displacing tenants even temporarily have often made it impossible for landlords to effect any adequate reconditioning of property which they earnestly desire to improve. For slums conditions in general, however, landlords and their agents, past or present, have a large responsibility; their multiplicity, the complication of their tenure, their frequent inefficiency and their not infrequent desire to extract the last penny of profit, regardless of all other considerations, present a formidable resistance to public effort for improvement.

The Slums Act.—The machinery for dealing effectively with slum property has now been provided under the Slums Act, and most of the large local authorities have completed the survey which they were required to undertake. The public conscience is insisting that the machinery of the Act should be effectively used. As will be seen from a later section of this report, the national campaign for abolishing slums in our larger towns has been fairly launched and though at one time it seemed doubtful as to whether local authorities would apply the Act in the manner intended by Parliament, the movement to abolish slums is now gathering more and more momentum. The Act has already been extended to Kingwilliamstown, Randfontein, and George, and applications have been received from four or five other local authorities, and it is anticipated that applications to extend the Act to other areas will also be forthcoming.

It is clear that the solution of the problem of the slums lies in the building of new houses and the enforcement of the Slums Act. If sufficient new houses could be built at low enough rents and in such positions that the workers could live in them and get to their work easily, then the slum dwellers would willingly transfer to the new houses and the slum problem would be automatically solved.

State Assistance to Housing.—The Government is prepared to lend money at 2 per cent. interest charges to local authorities willing to undertake sub-economic schemes of rehousing subject to the condition that local authorities will fix rentals so that after paying all charges the loss to them will be approximately equal to the loss incurred by the State.

Under the new Housing Act in Great Britain, it is proposed that the subsidy of the State should be £5 per house per annum. The local authority under that Act will be roughly in about the same position as a local authority in this country under the present sub-economic loans scheme, except that it will benefit from the longer period of redemption allowed. In Britain housing loans generally are repayable over a much longer period than is allowed in South Africa, where the maximum limit is 40 years. This limit is probably on the high side for South Africa and, in the opinion of some members of the Housing Board, should be restricted, in most schemes of cottage building, to 30 years.

When the sub-economic schemes were first authorised, the economic rate of interest was practically 5 per cent., and we advanced money at 3 per cent.; that is, on a £400 house, the Government gave an annual subsidy during the period of redemption of £8. Later the rate of interest was reduced to 2 per cent. when the economic rate was $3\frac{3}{4}$ per cent. This entailed a reduction in the subsidy to £7 per house. To-day the economic rate is probably $3\frac{1}{4}$ per cent., which means a further reduction to £5 per house. It is considered that with the increased cost of building, the Government should seriously considered the reduction of the rate of interest in sub-economic loans so that housing for the poorer classes may be subsidised by the Government to the extent of 2 per cent. of the annual interest charges paid by the Government on loans of this class granted to local authorities. There have always been people in South Africa who allege that the subsidising of houses by the State and local authorities create a fresh form of pauperism, but this will not really bear examination. After all, State assistance in education is now almost universal in civilised countries and nobody dreams of accusing a man, who receives a State subsidy by sending his child to school or to a university, of being a pauper. Frankly, this feeling against the principle of subsidies for housing is all nonsense. The country has long since made up its mind that the cruel waste of good human material must be stopped. Even when wages are fairly good there are many things that the fathers of children cannot pay for. The State, therefore, has to intervene and give effective help in education, in public health and in other matters. It is, of course, true that the well-paid worker can house his family without State help, but it is equally true that there are many for whom this is totally impossible. It is a false economy to spend £20 a year in educating a child and then to let it grow up in unhealthy surroundings so that it cannot get the full benefit of its education. It is certain that an unskilled labourer cannot afford to rent a decent house which is unsubsidised in a large urban area. He must either receive a subsidy or his children must remain in a slum. If we choose to say that as a matter of principle we will not have subsidies for housing, then the families of such labourers must live in slums. If we determine to abolish the slums, then we must, as a nation, face up to the necessity for the continuance of State assistance for new housing, possibly under conditions which will be more attractive to local authorities than those prescribed in the past.

The Need for more Medical Research.—The need for more medical research in South Africa has long been apparent to all. Certain major public health problems still await solution, and, despite the general measures taken to combat these diseases, little real progress can be effected until further laboratory and field research has been carried out. The problems include typhus fever, tuberculosis, typhoid fever, plague, pneumonia, leprosy and acute infective diseases of the central nervous system, such as meningitis, poliomyelitis, and infective encephalitis.

At a meeting of the Council for Public Health, 1935, it was recommended that further research on the etiological agents of typhus fever in South Africa was urgently required and that the admirable pioneer work of Dr. Pijper, of Pretoria, on this subject should be confirmed and extended. The determination of the exact types of virus causing typhus fever in the Union and the relationship of these types to those producing the disease in other parts of the world is essential before practical immunisation measures against typhus can be undertaken. With the large native population present in South Africa, adequate means of establishing an immunity against typhus would constitute an enormous advance in public health. Dr. Finlayson, the officer in charge of the new biological control laboratory, has been specially deputed to undertake this research.

The tuberculosis problem has recently developed to such an extent that its solution becomes one of the most pressing public health matters. In this field, research is urgently needed on the types of tubercle infection occurring in children and in adults. The significance of milk-borne tubercle infection must be assessed and the extent to which bovine tubercle infection of children

takes place in South Africa must be determined. Professor Rhodes, the Senior Government Pathologist in the Cape Peninsula area, and the Institute for Medical Research elsewhere, have commenced a long overdue investigation of this problem. Further, the extent to which tuberculosis is present in the community, as shown by the tuberculin test, is still unknown.

Typhoid fever is a most important health hazard in this country. For some years now Besredka's vaccine has been used in the Rand mines and elsewhere with apparently good results. No reliable statistical data has been published, however, and it is difficult to determine the real efficacy of this preventive measure without such an analysis which, with our shifting population, would be most difficult to carry out. It is notable that both the British and U.S.A. armies, which carry out prophylactic anti-typhoid measures on a large scale, are not yet convinced of the efficacy of Besredka's method, although the adoption of this method would mean the saving of large sums of money. Further, some simpler means of establishing the presence or absence of typhoid carriers in a community than are available to-day would also constitute a real advance in public health.

In the case of plague, anti-rodent measures must at present be considered the only reliable means of preventing the spread of this infection, and there is an urgent need for the appointment of a skilled biologist with a special knowledge of fleas further to study systematically the habits of the plague-carrying rodents in order that our anti-rodent measures may be perfected. The production of a reliable vaccine would do much to protect the immediate contacts of plague cases from incurring infection, but this is of relatively minor importance in South Africa. At present there are doubts as to the efficacy of some vaccines in use to-day, and the recent work of Schultz at the Lister Institute, London, has shown that the conditions of preparation of the vaccine are of paramount importance in considering its efficacy as a prophylactic.

Pneumonia is still a disease of major importance, particularly in the Rand mine area. The workers at the South African Institute for Medical Research have shown that the types of infecting agent have changed within recent years, and it is possible that certain cases are due to a virus infection. Much careful work on this problem is still required to supplement the work already done at the Institute, and the recent discoveries by Landlaw, Andrews, and Wilson Smith at the National Institute for Medical Research, London, and by Francis at the Rockefeller Institute, New York, on the causal agent of influenza may provide a line of attack which could be profitably pursued.

Acute infective diseases of the central nervous system include meningitis, chiefly due to the meningococcus. Some work on the typing of this organism has been carried out at the South African Institute for Medical Research, but a co-ordinated investigation to determine the different types of meningococci prevalent throughout the Union is needed. The acute virus infections, anterior poliomyelitis, and acute infective encephalitis, both occur in South Africa. Whilst the etiological agent producing the former is known, it is not known to-day whether this virus is of the same type as that found in Europe and America. The infective agent producing acute infective encephalitis in South Africa is undetermined, and an investigation of this problem must be carried out before adequate prophylactic measures and treatment can be instituted.

At present there is far too little done by way of medical research in the Union. It is, of course, to some extent a matter of increasing the money provision for research. However that may be, certain problems are practically untouched at present. For instance, little or no research has been carried out on the virus diseases of man. The various skilled workers in the South African Institute for Medical Research, the universities, Government laboratories, and private laboratories, whilst attacking certain problems, do not appear to possess any mechanism whereby their efforts can be co-ordinated and allocated to the best advantage in solving urgent public health problems.

Lastly, we have baffling problems in leprosy which, so far, have not been solved either in South Africa or elsewhere.

It is recommended that an expert committee should be set up to consider the more pressing problems and to advise generally how medical research and laboratory facilities could best be co-ordinated throughout the Union with a view to the more efficient application of these services to problems of public health; and in the work of the committee full advantage should be taken of the experience of the splendid research organisation existing at Onderstepoort for the study of diseases in animals.

The Biological Control Laboratories.—Following the appointment of Dr. M. H. Finlayson, M.B., Ch.B., B.Sc., on 1st May, 1934, as Serologist to undertake the examination of biological products, a survey of the methods of control in the United Kingdom, France, Germany, Denmark, U.S.A.,

and Canada was carried out by this officer before taking up his duties in South Africa.

As a result of this survey, a biological control organisation modelled chiefly on the system employed in the United Kingdom, but embodying certain features found in other countries mentioned above has been established at Capetown.

New laboratories have been constructed and equipped, enabling the biological testing of drugs, sera and vaccines to be undertaken and suitable accommodation for the housing and breeding of laboratory animals has been provided. The latter accommodation has been designed so as to enable both the biological control laboratories and the Union health laboratories to carry out their functions under satisfactory conditions.

Provision has been made for the appointment of adequate technical staff to assist the officer in charge of the biological control laboratories in carrying out the work assigned to him.

Regulations for the control of therapeutic substances, as laid down under section 83 of the Medical, Dental and Pharmacy Act, 1928, have been promulgated and will enable the Union Health Department to control the manufacture and import of vaccines, sera, insulin, posterior pituitary, organic arsenicals for treatment of venereal disease, and surgical ligatures. Certain drugs such as digitalis, strophanthin, and tinctures thereof will also be controlled, powers to examine these substances being obtained under the Food, Drugs and Disinfectants Act, 1929.

The biological control laboratories also will undertake the storage and distribution of certain international standard sera, obtained through the Director of Biological Standards, London, England.

Standard anti-venenes against Cape cobra and juff-adder venoms are being prepared from samples of monovalent sera, obtained from South African manufacturers. Experiments designed to produce a unit of comparison for anti-venenes are in progress, and it is hoped that all anti-venenes used in South Africa will be standardised in terms of this unit, in the near future. Further, a research on various other standardisation problems is being undertaken. The establishment of these control laboratories removes a long outstanding defect in the health administration of South Africa.

Matters under Special Investigation.—During the year a committee has been investigating the quesion of misleading advertisements in connection with patent and proprietary medicines. A report has been prepared by the committee and will, in due course, be made available for consideration by those interested. A large sum of money is spent annually by the public in South Africa and mainly by the poorer sections of the community on the purchase of patent and proprietary medicines, many of which are quite worthless. Much of this results from the publication of misleading and fraudulent advertisements. It is hoped that as a result of the labours of the committee it may be found possible for the Government to introduce legislation with the object of setting up effective machinery for bringing the whole matter under reasonable control.

Negotiations have been commenced with the Medical Association of South Africa and the South African Optical Association in regard to the necessity of defining by legislation the legitimate work of opticians and the desirability or otherwise of bringing duly qualified opticians on to a compulsory register under the Medical Council. These negotiations involve consideration of questions by both bodies of what is in the interests of the general public, and, if the negotiations are to be successful, the matters on which the ophthalmologists and opticians are in dispute will have to be approached mainly from this standpoint with a view to securing a satisfactory settlement.

Similar negotiations have been under way for some months past with the South African Dental Association and the South African Society of Dental Mechanicians with a view to securing agreement between the two bodies in regard to the compulsory registration of dental mechanicians. The Department is hopeful that as a result of these negotiations, which are now well advanced, it may be possible at any early date to prepare a draft Bill on which both associations will be in agreement.

King George V. Silver Jubilee Fund for combating Tuberculosis.—With the full approval of His Majesty the King, a national fund has been raised in this country for the purpose of combating tuberculosis. The fund was inaugurated by His Excellency the Governor-General, by a broadcast address to the people of South Africa on the 8th of April, 1935. The fund is vested in and administered by a Board of Trustees, all appointments being

ex officio, and the present occupants of the various offices mentioned below have indicated their willingness to serve:—

The Chief Justice of the Union;

The Minister of Public Health;

The Chairman of the United Municipal Associations of South Africa;

The President of the South African Medical Council;

The President of the Federal Council of the Medical Association of South Africa;

The Professor of Public Health, University of Capetown;

The Chairman of the Natal Anti-tuberculosis Association;

and at the first meeting of the Board, the Secretary for Public Health and the Accountant, Department of Public Health, were appointed honorary secretary and honorary treasurer respectively.

Up to the date of writing contributions to the fund received by the Board total £79,549. 0s. 8d., this amount being exclusive of the Union Government's contribution of £10,000 and the final collections by the Administrators' fund committees in each Province. It is confidently expected that the fund will reach a total of £100,000.

The moneys comprising the fund are being invested with the Public Debt Commissioners in Government stock for the most part bearing interest at 3½ per cent. per annum, and the Board's policy for spending the £3,500 or so, being the annual interest on the capital sum, will be determined at the first meeting after the fund has been closed.

It is the Government's wish that the moneys available to the Board will be expended on and utilized for such anti-tuberculosis measures as do not fall within the scope of the anti-tuberculosis campaign for which the Government and local authorities are jointly responsible.

II.—VITAL STATISTICS.

The following table summarises the salient features of the vital statistics of the European population for each calendar year since 1920:—

TABLE A.—UNION OF SOUTH AFRICA: SUMMARY OF VITAL STATISTICS OF EUROPEAN POPULATION, 1920-1934.

Calendar Year.	European Population (estimated).	Birth Rate per 1,000 of Population.	Death Rate per 1,000 of Population.		Death Rate per 100,000 of Population from				Percentage of Total Deaths, the Cause of which was Medically Certified.	Infantile Mortality Rate (Deaths of Infants under One Year per 1,000 Live Births Registered).	Maternal Mortality Rate (Deaths of Mothers in connection with Pregnancy or Childbirth per 1,000 Live Births Registered.)	Survival Rate or Rate of Natural Increase (Excess of Births over Deaths per 1,000 of Population).
			Actual or Crude.	Standardized.*	Diseases of Heart and Circulatory System.	Pneumonia and Bronchitis.	Cancer.	Tuberculosis (all forms).§				
1920.....	1,499,911	28·97	11·09	12·15	95·67†	113·87†	58·94†	46·00†	79·78	90·07	4·10†	17·88
1921.....	1,519,488‡	28·44	10·41	11·43	102·91	136·15	69·09	58·26	80·76	77·09	4·94	18·03
1922.....	1,556,241	27·52	9·48	10·41	97·99	127·24	70·88	47·74	82·96	72·91	5·21	18·04
1923.....	1,579,733	26·70	9·77	10·65	108·50	120·72	78·94	46·46	82·77	74·42	5·22	16·93
1924.....	1,610,774	26·29	9·62	10·44	123·92	123·79	76·36	51·59	84·74	73·73	4·75	16·67
1925.....	1,637,472	26·51	9·39	10·15	128·86	97·04	72·86	52·70	86·45	68·39	5·62	17·12
1926.....	1,676,660‡	26·16	9·59	10·28	127·21	113·44	71·18	53·41	87·76	64·82	4·56	16·57
1927.....	1,708,955	25·95	9·73	10·34	122·76	110·42	73·20	50·50	89·93	70·62	4·80	16·22
1928.....	1,738,937	25·77	10·15	10·69	133·53	127·72	77·52	50·95	89·93	70·49	4·98	15·62
1929.....	1,767,719	26·15	9·51	9.98	127·11	104·04	77·44	45·37	90·19	64·22	5·26	16·64
1930.....	1,797,900	26·44	9·69	10·08	132·33	112·87	82·62	46·76	91·15	66·84	5·26	16·75
1931.....	1,829,300	25·38	9·37	9·56	131·53	103·75	85·55	44·22	90·46	63·07	4·70	16·01
1932.....	1,859,400	24·17	9·97	9·98	137·52	113·75	89·06	42.33	90·84	68·57	5·31	14·20
1933.....	1,890,300	23·55	9·35	9·27	142·52	100·30	95·33	40·68	91·45	61·01	4·81	14·20
1934.....	1,914,700	23·44	9·68	‖	156·21	94.53	92·39	39·54	91·91	60·79	5·99	13·76

* The rate which would have obtained had the age and sex distribution of the population been the same as that of England and Wales at the 1901 census, the standard usually taken for international comparisons.
† Medically certified deaths only. Rates for subsequent years calculated on total deaths registered.
‡ Actual (per census).
§ Includes Miners' Phthisis combined with Pulmonary Tuberculosis.
‖ Figures not yet available.

The birth rate, which in 1933 had reached its lowest level, shows a further slight drop. The death rate has slightly increased, from 9·35 to 9·68 per 1,000 of the population. The infantile mortality rate, which is generally accepted as giving a fair indication of the sanitary development of a country, shows a slight fall as compared with that of the previous year, from 61 to 60·79 per 1,000 births; for both years it is well below the average of the previous five years, which was 66 per 1,000 births.

It will be seen from the above table that only essential information for 1934 has been made available in respect of European deaths. There is a real need in South Africa for the preparation of vital statistics affecting all races and not merely Europeans only. Notification of non-European births and deaths is compulsory only in urban areas, and in many of these owing to the large proportion of non-European male adults temporarily resident as labourers and to other circumstances, computations of death rates and similar statistics are useless or misleading.

It is greatly to be regretted that owing to lack of funds it was not possible even to enumerate the non-European population at the last census. The only reliable figures available for the non-European population are those of the decennial census enumerations, the last of which took place in 1921, when the figures were: Bantu, 4,697,813; Asiatic, 165,731; mixed and other coloured, 545,548; total, 5,409,092.

The following information and comparisons in respect of Europeans with other countries, supplied by the Director of Census and Statistics, are of special interest:—

Population of the Union: Estimates as at 30th June, 1934.—European, 1,914,700; non-European, Bantu, 5,761,900; Asiatic, 198,900; mixed and other coloured, 607,100; total non-European, 6,567,900. The European estimates are calculated on the average annual increases between the two last censuses together with the annual records of births, deaths and migration. The non-European estimates are based on the 1921 census, and the average annual increase between 1911 and 1921.

The following vital rates for various countries including the Union recorded in the latter for Europeans only are average rates for three-yearly periods.

Birth Rates.—Union of South Africa, 24·3; Portugal, 30·1; Greece, 30·4; Bulgaria, 29·3; Lithuania, 26·4; Italy, 24·1; Canada, 22·2; Australia, 17·3; U.S.A., 18·0; New Zealand, 17·4; France, 17·0; Germany, 15·3; England and Wales, 15·2; Holland, 21·7.

Death Rates.—Union of South Africa, 9·6; Australia, 8·8; New Zealand, 8·1; Germany, 11·1; England and Wales, 12·2; Belgium, 13·2; Italy, 14·3; France, 16·0; Lithuania, 14·8; U.S.A., 10·8; Portugal, 17·3; Canada, 9·9; Holland, 9·1.

Infantile Mortality Rates.—Union of South Africa, 64; New Zealand, 32; Australia, 41; Holland, 47; England and Wales, 65; France, 76; Germany, 79; Canada, 77; Belgium, 87; Italy, 117; Portugal, 138; Lithuania, 144.

Survival Rate or Rate of Natural Increase.—Union of South Africa, 14·7; Portugal, 12·8; Holland, 12·6; Canada, 12·3; Italy, 9·8; Australia, 8·6; New Zealand, 9·3; U.S.A., 6·9; Germany, 4·2; England and Wales, 3·0; France, 1·0.

III.—ADMINISTRATIVE MATTERS.

1. *Staff.*—The organisation and functions of the Department and its principal personnel as at 30th June, 1935, are set out in Annexure A. The increase in public health activities throughout the country—largely as a result of recent legislation—has placed a great strain on the head office staff, which will certainly have to be augmented on the clerical side if the Department is to continue to function efficiently. The matter has been represented to the Public Service Commission but is awaiting a settlement pending inspection of the work of the Department by the Commission.

The changes that occurrred during the year may be briefly indicated. As intimated in the last report, Dr. W. A. Murray, Senior Assistant Health Officer, retired on pension as from the 20th December, 1934. His post was filled by the promotion of Dr. E. H. Cluver, Assistant Health Officer, who was then nominated as Director of Medical Services in the Union Defence Forces in succession to Sir Edward Thornton. The resulting vacancy for an Assistant Health Officer was filled by the promotion of Dr. P. Allan, Medical Superintendent at the Nelspoort Tuberculosis Sanatorium, who was transferred to Capetown.

Dr. B. A. Dormer, M.B., B.S., B.Hy., D.P.H., was appointed Medical Superintendent, Nelspoort Tuberculosis Sanatorium, with effect from the

1st March, 1935. The medical staff at the sanatorium was also increased by the appointment of an Assistant Physican (Dr. H. R. Ackermann) as from the 1st August, 1935.

An Assistant Health Officer, in the person of Dr. H. S. Gear, B.Sc., M.B., Ch.B., D.P.H., D.T.M. & H., to deal mainly with epidemiological and venereal diseases problems, was appointed on the 29th May, 1935, with headquarters in Pretoria. Dr. Gear is a South African practitioner who had been holding an important post at the Lester Institute at Shanghai.

Dr. Marion Thomson left the Department on the 1st April, 1935, on marriage. She was succeeded in the post of Medical Inspector (Maternity and Child Welfare) by Dr. E. Drennan, B.A., M.B., Ch.B., D.P.H. Miss E. de Klerk was appointed Nurse Lecturer *vice* Miss P. H. L. Meier resigned.

The post of Principal Clerk in the general section was regraded to that of Second Grade Chief Clerk, and Mr. R. S. Gordon promoted thereto. This change was brought about simultaneously with his appointment as Chairman of the Central Housing Board.

The Transvaal malaria staff was increased by two sanitary inspectors. In Natal the malaria staff was augmented by the appointment of three additional sanitary inspectors, bringing the total up to nine inspectors.

A whole-time district surgeon, Dr. P. B. van der Lith, was appointed at Pietersburg in substitution for a part-time district surgeon; a part-time assistant district surgeoncy was also created there. At Bloemfontein, it was found necessary to provide a part-time assistant district surgeon to assist the whole-time officer stationed there. At Capetown a whole-time assistant district surgeon was appointed replacing the part-time district surgeon, Woodstock, and Pensions Medical Officer, The Castle.

The post of Medical Officer for Leprosy Research at the Pretoria Leper Institution was converted into that of Medical Officer.

Considerable difficulty has been experienced in carrying out in a reasonably efficient manner international requirements connected with the import and export of habit-forming drugs and particularly in furnishing annual estimates of requirements to Geneva. The Public Service Commission has recently agreed to the appointment of a trained pharmacist to the staff of the Department to take charge of this work. This officer when appointed will also be responsible for the supervision of the inspection of habit-forming drug registers.

The professional staff at the Government Laboratory, Capetown, was allotted the following part-time appointments at the University:—

Dr. Rhodes, the Senior Pathologist, to the position of Professor of Forensic Medicine; Dr. R. Turner, Assistant Pathologist, and Dr. C. A. M. Murray, to the posts of Lecturers in Forensic Medicine. Dr. A. A. Louw, District Surgeon, Capetown, was appointed Lecturer in Vaccination to the University of Capetown.

2. *District Surgeons.*—In addition to the creation of a third whole-time district surgeoncy in Johannesburg and one in Pietersburg, further part-time posts were created as follows:—

In the Cape Province, additional district surgeoncies at Deben, Rhodes, Touws River, De Doorns, Velddrift, Sulenkama, Greyton, Pofadder, Danielskuil, Ensikeni, Kirkwood, Cookhouse and Franklin.

In the Orange Free State, an assistant district surgeoncy in Bloemfontein and additional district surgeoncies at Rosendal and Luckhoff.

In the Transvaal, additional district surgeoncies at Olifantsrivier, Waterkloof, Lake Chrissie and Fochville.

The present distribution of district surgeons is set out in Table B.

TABLE B.—DISTRICT SURGEONCIES AND ADDITIONAL DISTRICT SURGEONCIES AS AT 30TH JUNE, 1935.

Province.	Whole-time.	Whole-time, but jointly with local authority or public body.	Part-time.			Total.
			On inclusive annual salary.		On annual salary with certain supplementary fees and allowances.	
			District Surgeons.	Additional District Surgeons.		
Cape.....	4	3	—	21	136	164
Natal.....	3	—	—	—	42	45
Transvaal.....	6	—	1	15	56	78
Orange Free State..	1	—	—	13	47	61
UNION.....	14	3	1	49	281	348

The fourteen whole-time officers are those at Capetown (2); Durban (3); East London, Port Elizabeth, Pretoria (2); Johannesburg (3); Pietersburg; and Bloemfontein.

Periodical Tours by District Surgeons under section 4 of Act No. 36 of 1927.—The primary object of these tours is to bring medical aid within reasonable reach of the general public of localities concerned and along the lines of travel, going and returning, and to combine this with preventive action in regard to any matter affecting or likely to affect the health of individuals or families, or of the public.

An outstanding condition under which these tours are authorised is that a district surgeon has to furnish an undertaking in writing to the effect that he will be prepared to see and treat private patients at the outstations and on the lines of travel at the same fees as he charges patients seen at his headquarters consulting rooms. Private patients living in the outlying areas avail themselves of this opportunity to a considerable extent.

During the course of the financial year ended 31st March, 1935, tours were carried out in 53 district surgeoncies at a cost of £4,289. A total of 20,892 patients were seen and treated by the district surgeons—12,170 Government patients and 8,722 private patients. On the current financial year's estimates an amount of £6,400 has been provided for this purpose, but this amount will have to be increased as several further requests reached this Department but have not been able to be authorised owing to the insufficiency of funds provided. Every care has been taken to arrange these tours so as not to interfere unduly with private medical practice, and the advice of the Medical Association of South Africa has been freely sought whenever difficulties appeared likely to arise in this connection.

3. *Local Authorities and their Health Staffs.*—The numbers of the various classes of local authorities under the Public Health Act as at 30th June, 1935, are shown in Table C.

TABLE C.—LOCAL AUTHORITIES UNDER THE PUBLIC HEALTH ACT (1919) AS AT 30TH JUNE, 1935.

Province.	Municipalities.	Village Management Boards.	Local Boards.	Village Councils.	Health Committees.	Local Administration & Health Boards.	Magistrates.	Divisional Councils.	Board of Health.	Mining Commissioners.	Total.
Cape.....	131	91	23	—	—	—	29	94	1	1	370
Natal.....	11	—	15	—	18	8	44	—	—	—	96
Transvaal.....	28	—	—	30	40	—	43	—	—	3	144
Orange Free State	61	7	—	—	—	—	38	—	—	1	107
UNION.....	231	98	38	30	58	8	154	94	1	5	717

Whole-time medical officers of health are employed by only nine of the local authorities listed, namely, the municipalities of Bloemfontein, Capetown, Durban, East London, Johannesburg, Pietermaritzburg, Port Elizabeth, and Pretoria, and the Divisional Council of the Cape. The Kimberley Board of Health has a medical officer who devotes some of his time on behalf of the Kimberley Municipality and some to laboratory work at the Kimberley Hospital, but does no private practice. The question of his formal appointment under section 12 of the Public Health Act by the two local authorities acting jointly so as to enable the Government to contribute to his emoluments under section 2 of Act No. 15 of 1928, has been under discussion during the year, and it is expected that a satisfactory settlement will be reached shortly. At Grahamstown and Queenstown there are whole-time officers who carry out the combined duties of district surgeon and medical officer of health to the municipal and divisional council. At Germiston a whole-time medical officer of Health has been appointed as from the 1st July, 1935.

The number of certificated sanitary inspectors employed by local authorities is increasing. On the 30th June, 1935, those employing such officers devoting the whole of their time to sanitary work were 101 in number, namely 47 in the Cape, 11 in Natal, 16 in the Orange Free State and 27 in the Transvaal. The total numbers of such persons are: sanitary inspectors 270, and health visitors 16. These officers are very necessary in all organised communities. Numbers of young men are taking the training prescribed by the Union Government and the Royal Sanitary Institute. A very good type of candidate is entering for the sanitary inspectors' examination, and, on account of the large number of candidates and the relatively few posts available, it was recently decided to raise the standard of the examination, which was already much stiffer than the corresponding examination in Great Britain. On the other hand, the supply of trained health visitors is only about equal to the demand.

IV.—WORK OF THE DEPARTMENT.

1. *Inspections, Investigations and Field Work.*—During the years of financial stringency this very important side of the Department's work was very severely limited. During the past year, however, matters have improved considerably, and it was possible for officers of the Department to carry out a fairly large number of inspections. The number is still altogether inadequate if the communities which are developing throughout the Union are to receive adequate hygienic guidance.

Thus although there are over 400 urban local authority areas without the guidance of qualified health officials, it was only possible for medical officers of this Department to carry out systematic health inspections of 43 such areas. The annual number of systematic inspections of this kind should be over 100 if the original aim of the Department in this connection is to be achieved. No local authority, however small, should be left without expert hygienic advice for more than three years. Much has, however, been done during the year at the smaller centres by means of the public health nurses, and inspectors employed by the Department.

Numerous inspections of a special nature were carried out. With a small staff these had to be limited to emergency matters such as dealing with outbreaks of disease. Such emergency work greatly interferes with systematic work. Systematic work is much more satisfactory and if it could be adequately carried out, it should to a considerable extent eliminate the necessity for emergency work.

2. *Publications by Members of Staff.*—

Sir E. N. Thornton, *Chief Health Officer.*

"Some Problems of Preventive Medicine." Presidential Address to South African Medical Congress, 1934. (*S.A. Medical Journal, 27th October*, 1934.)

Dr. E. H. Cluver, *Senior Assistant Health Officer.*

"Le typhus dans l'Union de l'Afrique du Sud" (Typhus in the Union of South Africa): Bulletin Mensuel Office International d'Hygiene Publique, Paris. (Tome XXVI, No. 9. September, 1934, pp. 1531-1537.)

In addition to these publications numerous addresses on public health subjects were delivered by members of the staff to gatherings convened by local authorities and other organisations.

3. *Health Publicity and Educative Work.*—In Annexure B, pamphlets and leaflets which have been prepared, published and distributed by the Department to date, are furnished.

The following cinema films are owned by the Department and are available to local authorities and public bodies for exhibition purposes:—

"Fly Danger."
"The Trail of a Pesky Fly."
"The Rat Menace."
"Your Mouth."
"Tommy Tuckers Tooth."
"The Story of John McNeil" (tuberculosis).
"The War on the Mosquito."
"Malaria."
"Bilharzia."
"In His Father's Footsteps" (insanitary farm: enteric).
"The Long Haul *versus* the Short Haul" (dirty milk).
"Drinking Health" (pure water).
"One Scar or Many" (vaccination).
"Bringing it Home" (child welfare).
"Well Born."
"Baby's Bath and Toilet."
"The Best Fed Baby."
"Why Willie was Willing to Wash."
"How to Live Long and Well."
"Peter and the Moon Man" (cleanliness).

A set of small models, specially made for the Department by a health inspector, who is also a clever handyman, is stocked by the Department's health officers at Pretoria, Capetown and Durban for loan to local authorities and other bodies for demonstration during "health weeks" and on similar occasions, and for illustrating lectures on hygiene. Each set includes a model for illustrating—

(1) method of rodent-proofing buildings;
(2) an "open-air" room for home segregation of a tubercular patient;
(3) Baber's maggot-traps;
(4) Russel's modified maggot-trap;
(5) Russel's modified box fly-trap;
(6) Squatting closet for native use.

4. *Laboratories.*—The work done by the Government laboratories at Capetown and Durban and that carried out on behalf of the Government at the South African Institute for Medical Research, Johannesburg, and at Port Elizabeth, is shown in Table D.

TABLE D.—PATHOLOGICAL LABORATORIES: ANALYSES AND EXAMINATIONS, YEAR ENDED 30TH JUNE, 1935.

Particulars.	Laboratories.		South African Institute for Medical Research.	
	Capetown.	Durban.	Johannesburg.	Port Elizabeth Branch.
Specimens Examined for—				
Government Departments—				
Agriculture	52	28	—	—
Customs and Excise	56	—	11	—
Defence	1,017	20	1,262	—
Interior (Mental Hospitals, etc.)	614	154	814	53
Justice	—	302	1,844	—
Justice (Prisons)	1,260	187	1,044	151
Mines (including Miners' Phthisis)	—	—	12,138	—
Posts and Telegraphs	3	—	—	—
Public Health (including Leper Institutions)	8,257	36,457	41,404	6,076
Public Works	—	—	—	—
South African Railways and Harbours	70	3,098	—	—
Other Government Work	—	18	546	19
General Hospitals (Provincial)	2,326	6,804	32,895	5,210
Local Authorities	32,142	21,171	4,735	11,483
Medical Practitioners	12,364	13,533	17,949	1,628
Department of Education (Provincial)	—	1,097	—	—
Other Governments or Administrations	369	—	81	—
Others	5	—	588	165
TOTAL	58,535	82,869	115,311	24,785
Manufactures and Issues—				
Autogenous Vaccines.....c.c.	—	25	32,625	5,350
Bacterial Vaccines (stock).....c.c.	—	—	441,011	Included in Johannesburg figures
Tuberculin Dilutions.....c.c.	—	—	—	
Sera (various).....c.c.	—	—	640,951	
Anti-rabic Vaccine.....c.c.	40,000	—	—	—
Bulgarian Milk Cultures.....bottles	—	—	—	—
Insulin.....tubes	—	—	—	—
Chaulmoogra Oil Preparations.....c.c.	251,200	—	—	—
Smallpox Vaccine—Calf Lymph (prepared at Vaccine Institute, Rosebank)..tubes	1,060,963*	—	124,024	346
Attendances at Courts of Law by Members of Staff	215	7	5	—
Total Days' Absence entailed by such attendances	130	7	27	—

* 1,276,400 tubes manufactured during year.

The new biological control laboratories established at Capetown under Dr. Finlayson are nearly completed. The Department has incurred considerable expense in designing and equipping these laboratories in accordance with modern requirements. The necessary structural alterations in the laboratory buildings at Capetown are nearly completed, and most of the equipment which had to be imported has come to hand. It is, therefore, hoped that the actual serological work of this new sub-division will be brought into full working order during the coming year.

5. *Port Health Administration.*—The health work carried out at the Union ports during the year is shown in a summary in Annexure C to this report.

Strict supervision is kept at all ports to preclude the possibility of infection being introduced into the country from ships entering our waters. The table in the annexure shows the large number of cases of infection occurring in such vessels which necessitated action being taken by the port health authorities.

As in previous years, there were large numbers of children suffering from measles on Japanese immigrant boats *en route* to South America. These boats were always placed under restricted pratique, Japanese immigrants under twelve years of age not being allowed to land, and shore visitors being debarred from going on board.

The strictest measures are adopted for safeguarding the ports from the possibility of introduction of rodent plague from foreign countries and from infected inland areas in South Africa where plague is endemic in wild rodents. Ships arriving from plague-infected ports or ports serving plague-infected countries are carefully examined; their holds are searched before

pratique is given and again during discharge of cargo. Traps are set in the vessel during her stay in port and the sheds into which cargo is unloaded for several nights after arrival. In accordance with the terms of the International Sanitary Convention, the deratization and exemption certificates of all deep water vessels are carefully scrutinized. The regular and systematic inspection and deratization of ships as laid down in article 18 of the Convention has to a considerable extent eliminated the ship rat, and it is now exceptional in our ports to find badly rat-infested ships. In fact, difficulty is often experienced in securing specimens from ships for bacteriological examination. The only vessels on which some rat infestation is still regularly found are those which depend on the sulphur pan method of deratization. No plague infection was found among any of the hundreds of rats trapped and destroyed on ships or in the port areas during the year.

No cases of any of the major infectious diseases (cholera, plague, smallpox, yellow fever) arrived at any of our ports during the year. Cases of cholera were reported on two South African bound ships. The " Incomati ", carrying passengers on a voyage from Calcutta to Durban, landed a fatal cholera case at Colombo. The port health authorities at Colombo thoroughly disinfected the compartments that had been occupied by the patient. No further cases occurred on the voyage to South Africa. S.S. " Bodnant ", previous to her departure from Calcutta *via* Rangoon to Durban, had landed a case of cholera.

Passengers from Indian ports are conforming satisfactorily to our regulations, in that they are being vaccinated against smallpox not less than twelve days prior to embarkation, certificates signed by approved health authorities being carried. Some difficulty arises in the case of crews of cargo ships which sail from an Indian port within a few days of arrival. Vaccination is, however, generally carried out shortly after the ship reaches the port, and certificates issued.

Influenza was prevalent on ships during the latter months of the year under review. Its incidence cannot be accurately gauged as ships' surgeons rarely declare this form of illness unless there are fatal cases on board.

6. *Health of Natives on the Mines.*—The work in connection with the investigation and supervision of health conditions among the native mining population had to be curtailed very considerably as Dr. Fourie, Assistant Health Officer for the Witwatersrand area, had to be seconded for lengthy periods to more urgent duties in connection with typhus and plague outbreaks.

With the steady expansion of the industry, the number of natives employed on the mines has increased from approximately 250,000 in June, 1934, to 275,770 in June, 1935. As the result of this increase, construction of new compounds and extension of old compounds have been carried out on a considerable scale. Steady progress has also been made in the reconditioning of the older types of compounds and the substitution of partitioned concrete bunks for the wooden bunks. Hospital accommodation has been improved and extended to meet the demands of the new situation.

Health conditions have been good. Scurvy and other preventable diseases have not been unduly prevalent.

The supervision of compounds has been particularly satisfactory.

The number of deaths from heatstroke was 13 in 1934 as compared with 23 in 1933, giving a death-rate of ·05 per 1,000 per annum as compared with 0·09 in 1933 and ·08 in 1932. As pointed out by the Government Mining Engineer in his annual report for the year 1934, this decrease can fairly be attributed to the greater attention paid to the acclimatization of natives before finally placing them on work of an arduous and exhausting nature in places where high temperature conditions prevail, and also to improvement in the ventilation of working places.

The results of the experiment with the first batch of " tropical " labour from Bechuanaland, proved very satisfactory.

It is popularly believed that the native can do a heavy day's work on an empty stomach, that a nutritious breakfast is unnecessary, that at most a ration of mealie pap is all that he really needs. On certain of the gold mines the fact has now been established that a nutritious morning meal is not only desirable for health reasons, but abundantly justifies itself by the increase in working efficiency of the labourers. So impressed was the Gold Producers' Committee by this that last April it recommended all the mines to take steps to provide a nutritious morning meal for their native employees before they go on shift. It was pointed out that porridge or mahou is *not* a satisfactory morning ration, and that the ingredients of this morning meal should be varied since the natives quickly tire of monotonous fare. The dishes recommended as most favoured and nutritionally satisfactory for the purpose were meat stew, mealies and beans cooked in fat, and sausage. The

advantage of sausage is that it is quickly issued, an important consideration in the limited time between waking and going on shift. Further, well-sweetened coffee or cocoa was recommended to supplement the meal. This procedure, which will be an innovation on many mines, is a commendable forward step in health supervision of the native mining population. It will not mean any serious addition to the native feeding costs, as most of the food issued will count as part of the existing daily ration; the main difficulty therefore in arranging for the issue of a portion of this ration in the morning will be merely an administrative one.

7. *Trade Dermatitis.*—At the request of the Government Printer an Assistant Health Officer in this Department visited the Government Printing Works, Pretoria, and carried out an investigation into the cause of dermatitis amongst the artisans employed there. The men examined showed unmistakable lesions of an irritant dermatitis. The parts chiefly affected were the dorsum of the fingers and hand and between the fingers. In none of the cases was the condition found in a severe form, and it was noticed that men with naturally dry skins seem to be more readily attacked. The condition was found almost exclusively amongst the employees who handle the different acids (sulphuric, hydrochloric, nitric and carbolic acid), bichromate solution, turpentine and lye. These substances were, however, not entirely encountered during the course of actual employment, as it was ascertained that in order to remove ink and other stains from the hands various agents such as ammonia, turpentine, petrol, hydrochloric acid, paraffin and sodium hyposulphite solution were being used. It was noticed that rubber gloves are provided to those artisans who by virtue of their employment are required to put their hands into a solution of corrosive substance. The constant use of rubber gloves cannot, however, be recommended, as such a practice favours an attack of dermatitis. As far as could be ascertained no other preventive measures are adopted. The *preventive measures* recommended were that all employees who are required to handle any corrosive acids, turpentine, petrol, bichromate solution or the inks should be required to rub into the pores of the hands and forearm a mixture of equal parts of lanolin and olive oil supplied by the works. If the skin feels too greasy after thorough rubbing, the excess may be wiped off with a clean cloth. At the luncheon period these workers should be supplied with a mixture of sawdust and liquid soap (the sawdust should be moistened with the liquid soap) which, together with warm water, will readily remove the ink and stains without injury to the skin. The hands and arms should then be rinsed in plain warm water and thoroughly dried. Before entering the workrooms the first process should be repeated and at the end of the shift the cleansing process should be repeated. Employees suffering from even minute abrasions or cuts on the hands should be instructed to report at the ambulance room for dressing prior to commencing work, as even small scratches may become contaminated with chemicals and form the primary focus of a spreading dermatosis.

Treatment.—In a well-marked case the affected parts should be washed as little as possible and no soap should be applied to them. The following cream, frequently applied, will be found useful:—

℞. Zinci Oxidi ... ... 3 drachms.
Lanolin ... ... 1 drachm.
Aq. Calcis ... ... half an ounce.
Ol. Amygdalae dulc ... ... half an ounce.

After the application of this cream the parts should be kept covered or bandaged to prevent irritation and infection.

As far as can be ascertained these measures have been entirely satisfactory in preventing further cases and curing those who were suffering from the particular skin disease. A copy of the Assistant Health Officer's report on the subject was forwarded to the Federation of Master Printers by the Government Printer and, it is understood, has been brought to the notice of the members of the printing trade in the Union.

V.—INFECTIOUS AND PREVENTABLE DISEASES.

1. *Notifications.*—The following table shows the notifications of infectious diseases by medical practitioners during the year, the totals for the previous year being inserted for comparison. It must be borne in mind that many cases of such diseases, particularly in natives, are never seen by a medical man, and consequently are not notified:—

TABLE E.—NOTIFICATION OF DISEASES BY MEDICAL PRACTITIONERS DURING THE YEARS ENDED 30TH JUNE, 1934, AND 30TH JUNE, 1935.

Disease.	Year Ended 30th June, 1934.	Year Ended 30th June, 1935.										
	Union.	Union.	Cape Province, excluding Transkei.		Transkei.		Natal.		Orange Free State.		Transvaal.	
	Total.		European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.
Anthrax	61	54	8	19	—	2	—	2	—	14	4	5
Diphtheria	1,780	1,749	715	307	4	10	245	53	53	27	303	32
Encephalitis, Infective	16	42	12	13	—	—	2	1	—	—	6	8
Enteric or Typhoid Fever	8,267	4,377	663	879	18	303	111	237	86	185	668	1,227
Erysipelas	398	434	106	66	2	3	15	5	8	1	144	84
Lead Poisoning	3	4	1	1	—	—	1	—	—	—	1	—
Leprosy	105	112	3	27	—	14	—	8	—	7	2	51
Malta Fever	—	36	6	9	—	—	1	—	—	—	1	19
Meningitis, Epidemic Cerebro-spinal	286	532	51	102	—	1	6	11	5	11	57	288
Ophthalmia, Gonorrhoeal	50	72	7	48	—	2	1	6	—	—	4	4
Ophthalmia Noenatorum	351	415	46	273	—	6	—	6	8	5	45	26
Plague [for detailed list of cases and deaths, see Table H (i)]	39	290	—	11	—	48	—	—	25	172	1	33
Poliomyelitis, Acute	64	61	23	22	—	—	2	—	1	—	9	4
Puerperal Fever, including Puerperal Sepsis	355	438	62	152	—	12	8	20	4	4	106	70
Rabies	3	3	—	—	—	—	—	—	1	1	1	—
Scarlatina or Scarlet Fever	1,283	1,964	384	29	10	2	119	2	114	3	1,294	7
Smallpox (for detailed list of cases and deaths, see Table J)	29	29	1	9	—	—	—	3	—	7	—	9
Trachoma	30	48	13	25	—	—	—	1	—	1	2	6
Tuberculosis	7,693	8,896	492	3,683	—	1,758	99	1,090	14	177	130	1,453
Typhus Fever [for detailed list of cases and deaths, see Table L (iv)]	3,158	6,826	35	16,82	3	1,178	16	208	29	3,246	14	415
TOTALS	23,971	26,382	2,628	7,357	37	3,339	626	1,653	348	3,861	2,792	3,741

2. *Bilharziasis or Human Schistosomiasis.*—A detailed account of the bilharzia problem as it exists in the northern and eastern coastal regions of the Union, and an account of the work hitherto done to combat this disease was given in the last annual report. This work is being fairly actively carried out in the Transvaal under the auspices of the Transvaal Bilharzia Committee on which the Transvaal Education Department, the South African Red Cross Society and the Union Health Department are represented. The work consists in arranging school camps where infected children are treated along mass lines, the provision of safe swimming baths and propaganda generally in the regions where the disease occurs. For carrying out this work, the Transvaal Provincial Administration contributes £250, and the Union Health Department £50, annually, to the Transvaal Bilharzia Committee, while the South African Red Closs Society supplies drugs and the assistance of members of its voluntary aid detachments at camps. In the other two provinces affected, no systematic anti-bilharzial work is being carried on.

It was pointed out in that report that a first essential for a successful anti-bilharzial campaign is an accurate survey of the affected areas. It is necessary to know the exact distribution of the carrier snails and to what extent such snails are infested with the bilharzia worms. This latter depends in turn on the extent to which the human population (particularly the native population) of the area is infected with urinary bilharzia and the degree of their insanitation; unless the bilharzia eggs voided with the urine reach water in which snails live, the snails cannot become infested.

During the year this Department made a commencement with the carrying out of a bilharzia survey. The malaria field staffs of Natal and Transvaal were put through a thorough course of schistosomiasis. They will carry out the survey in conjunction with their malaria field work. If only these officers are to be employed on the work, the survey will necessarily take many years to complete; during the malaria season they are too fully occupied in dealing with mosquito breeding to allow of much opportunity for making observations in snails. From a cursory field examination already carried out, it appears that the Nelspruit area, White River, Crocodile and Kaapse Valleys are heavily infested and that in these areas bilharziasis is at least as great a menace to the health of the rural population as malaria. The work in the Transvaal is being carried out in close co-operation with Professor Mönnig of the Onderstepoort Laboratories.

Any impediment to the free flow of a river fosters stagnation, and, in countries affected with schistomiasis, increases the risks from the snail hosts of the locality by encouraging the growth of those water plants on which they feed. We must, therefore, be prepared for an increase in the bilharzia incidence among the population in the vicinity of some of the large irrigation schemes now being carried out, unless active anti-snail measures are adopted from the start. As evidence of this is the not inconsiderable infestation of the *Physopsis* snails and human beings along the streams piled back as the result of the Hartebeestpoort Dam near Pretoria. For a number of years *Physopsis africana* has been found on the dam wall as well a *Lymnaea natalensis* infested with *Fasciola*. During the drought years this lake has not been very full and the increase of shallow water has resulted in an increased breeding of pond snails with an increased prevalence of bilharzia infection at Brits and the other settlements which derive their water from the dam.

Wherever opportunity offers, propaganda work is done by officers of the Department. Public Lectures on bilharzia are given. The police in training at the Pretoria depot are instructed in the subject by an assistant health officer. Bilharzia is also a subject in the courses given annually at the Tzaneen Malaria Station and at Nelspruit by the malaria staff.

3. *Diphtheria.*—That an almost entirely preventable disease like diphtheria should continue to take a heavy annual toll both by death and crippling of the child population is to be greatly deplored. The number of cases of diphtheria notified in the Union during recent years is as follows:—

Year ended June, 1933	1,205
,, ,, 1934	1,780
,, ,, 1935	1,749

The disease is preventable by a simple immunisation process in children. Active immunisation on a small scale has been undertaken by the Health Department of the City of Capetown for several years past. Thus in the year ended June, 1933, the number of children immunised was 4,370. In order that diphtheria infection may be reduced it is essential that such immunisation of children should be actively carried out in the Union wherever is is reasonably practicable to do so.

The Council of Public Health at its meeting in March, 1935, resolved :—

"This Council considers that the immunisation against diphtheria of inmates of orphanages and other institutions should be encouraged."

The effect of active immunisation is well illustrated by comparing the death rates from diphtheria in immunised and non-immunised groups of children in New York City during the years 1931-34.

	Protected.	*Unprotected.*
1931	4·1	20·1 per 100,000.
1932	2·0	34·5 ,,
1933	0·9	13·5 ,,
1934	1·9	25·5 ,,

Similar results have been obtained in other cities in the United States of America, in Canada, Great Britain, France and Holland, and there is no doubt that active immunisation is capable of reducing the incidence of diphtheria to a low level if not altogether abolishing the infection.

Fatal diphtheria occurs most frequently at early school age and it is therefore essential that children should be immunised either immediately before or after they have gone to school. The optimal time for immunisation is between the ages of one and three and at this time children should be immunised with toxoid (anatoxin). It is most important that immunisation should be carried out continuously for there is no great decline in the attack rate if 60 to 70 per cent. of the school children are immunised and the schools are only recruiting non-immunised children. Only when about one-third of the children of pre-school age are immunised is a marked decline in the disease incidence noticeable. Children over the age of five should be immunised with toxoid-antitoxin floccules, the inoculation in these cases being rarely followed by any reaction. Once active immunity is produced it is permanent. A few artificially immunised children relapse but immunity rapidly develops in these cases following mild infections with diphtheria.

There is no good reason to-day why every child should not be immunised. There is no danger to the child if toxoid or toxoid-antitoxin floccules are used in the process. The manufacture and importation of toxoid and toxoid-antitoxin fluoccules are now controlled by the Biological Control Laboratories of the Union Health Department. Satisfactory progress in this field can only be made with the whole-hearted support of the general practitioner who is the real adviser of the public on health matters. Parents must be convinced of the value of prophylactic immunisation against diphtheria and impressed with the harmlessness of the procedure. Once parental prejudice is overcome and active protection against diphtheria becomes generally adopted, little time will elapse before this disease ceases to be of major importance in the Union.

4. *Enteric or Typhoid Fever.*—The notifications of typhoid fever during the past year numbered 4,377. This figure, although considerably lower than that of the previous year, nevertheless indicates that the disease is still unduly prevalent in the Union, more especially when it is borne in mind that many cases occurring in rural areas and in native reserves are not notified owing to the fact that such cases are frequently not seen by medical men.

In urban areas, where the essential hygienic services, such as domestic water supply, milk supply and sewage disposal are effectively supervised and efficiently conducted, the measures adopted against the spread of enteric fever consist chiefly in the prevention of the introduction of the disease from outside areas. Thus, the "carrier" (i.e. a person who continues to excrete typhoid bacilli for months or years after recovery from an attack of the fever) and his movements are a matter of vital concern to the urban health authorities. The urban health authorities are particularly concerned with persons employed in the dairying industry and in allied industries concerned in the production and distribution of articles of food and drink.

Owing to the fact that many of these employees are natives, who return from time to time to rural areas or native reserves, their supervision is a matter of great difficulty. Several urban outbreaks of enteric fever have, in the past, been traced to native "carriers" employed in the dairying industry and it is becoming increasingly the practice in the larger urban areas, to submit natives employed in dairy work to a widal or complement fixation test. Should these tests give a positive reaction, the individual concerned is excluded from the industry. These tests, however, are not altogether astisfactory, in that "carriers" of the disease may occasionally give a negative serological reaction. It is possible, however, by means of these tests, to exclude a considerable percentage of potential "carriers" of the disease, though the matter becomes more and more difficult with the increasing use of anti-typhoid vaccine.

In rural areas, where no organised public health services exist, the means of combating the disease present considerable difficulties, inasmuch as each individual householder has to supervise and carry out his own essential health services. It frequently happens that the domestic water supply is insufficiently guarded against possible pollution and the disposal of human excrement is often very unsatisfactory from the hygienic point of view. In addition, fly-breeding generally takes place on a large scale and the flies, more often than not, have free access to kitchens and food supplies. Statistical information at the disposal of this Department indicates that the eight large towns in the Union which have organised public health and sanitary departments, controlled by a whole-time medical officer of health, the incidence of enteric fever during the last five years has on no occasion risen above 3 per 1,000, and the figure is generally less tha nl per 1,000. In the smaller semi-rural villages, where no organised public health service exists, figures show an incidence rate of 20 per 1,000 and in some cases the incidence may even rise to over 60 per 1,000.

The Union Health Department has, in the past, as a matter of policy, devoted considerable attention to the rural areas and has conducted propaganda by means of pamphlets and personal visits by health officers, and has thus striven to improve the state of rural hygiene.

One of the chief difficulties encountered by this Department in rural areas has been that, apart from the Cape Province, and to a lesser extent in Natal, there are no local authorities beyond the municipal borders of the towns and villages and, until effective rural local authorities are established, it is unlikely that the incidence of rural enteric fever will show any appreciable diminution.

The notifiecations of typhoid during recent years were as follows:—

1926-27	4,018	cases.
1927-28	5,787	,,
1928-29	4,963	,,
1929-30	3,775	,,
1930-31	4,793	,,
1931-32	4,505	,,
1932-33	4,389	,,
1933-34	8,267	,,
1934-35	4,377	,,

As has been pointed out in previous reports the actual incidence of the disease must be vastly greater than these figures indicate. Since it punishes gross uncleanliness it is most prevalent among the lowest strata of our society, namely, the least civilized of the Bantus. Among them notification of disease and death is extremely faulty. Among the Bantu too the causative bacillus not infrequently produces a condition which is not recognisable as typhoid apart from special laboratory tests. The classical picture is more often than not absent. Many, if not most cases of typhoid, are likely to be missed in native communities where modern laboratory facilities are entirely absent.

As in previous reports a table has been prepared showing the incidence of typhoid in certain local authority areas during the year. Since the degree of prevalence must be looked upon as a criticism of the general cleanliness and sanitary efficiency of the area it is hoped that this " black list " will have a salutary effect on those communities which appear high up on it.

TABLE F.—ENTERIC OR TYPHOID FEVER—NOTIFICATION AND INCIDENCE IN CERTAIN LOCAL AUTHORITY AREAS DURING THE YEAR ENDED 30TH JUNE, 1935 (ARRANGED IN ORDER OF INCIDENCE RATE)—EXCLUDING CASES RETURNED AS "IMPORTED".

Place.		Notifications.			Incidence per 1,000 of Population.		
		European.	Non-European.	Total.	European.	Non-European.	All Races.
Tulbagh	M.	27	10	37	42·59	25·25	35·92
Nigel	M.	—	49	49	—	22·17	13·61
Alice	M.	—	32	32	—	19·07	13·45
MeGregor	M.	4	8	12	12·62	13·05	12·90
Porterville	M.	5	13	18	4·41	27·03	11·16
Uniondale	M.	11	3	14	17·00	4·13	10·20
Springs	M.	16	205	221	2·09	13·75	9·79
Dewetsdorp	M.	—	11	11	—	15·03	6·36
Umtata	M.	10	14	24	4·34	7·74	5·77
Ladybrand	M.	7	14	21	2·92	8·67	5·24
Roodepoort	M.	61	61	122	7·49	3·59	4·86
Cradoek	M.	8	22	30	2·22	6·23	4·20
Beaufort West	M.	19	8	27	5·69	2·55	4·17
Oudtshoorn	M.	28	16	44	5·00	3·10	4·09
Brakpan	M.	23	85	108	2·05	4·84	3·75
Germiston	M.	43	83	126	2·20	4·98	3·48
Graaff Reinet	M.	10	19	29	2·25	3·99	3·15
Krugersdorp	M.	10	63	73	·73	5·78	2·97
Hercules	M.	11	6	17	2·45	3·71	2·79
Pietersburg	M.	6	14	20	1·63	3·88	2·74
Middelburg (C.)	M.	3	9	12	1·38	3·95	2·69
Klerksdorp	M.	15	1	16	4·17	·39	2·59
Paarl	M.	27	9	36	3·46	1·36	2·49
Queenstown	M.	5	26	31	·76	3·40	2·18
Benoni	M.	10	101	111	·57	2·96	2·15
Boksburg	M.	36	48	84	2·58	1·88	2·12
Aliwal North	M.	1	12	13	·37	3·11	1·99
Ladysmith	M.	4	9	13	1·09	2·53	1·80
Pretoria	M.	73	55	128	1·30	2·07	1·55
Uitenhage	M.	4	16	20	·43	2·50	1·27
Randfontein	M.	2	25	27	·61	1·37	1·27
Port Elizabeth	M.	48	28	76	1·18	·98	1·10
Johannesburg	M.	144	149	293	·72	1·02	·85
East London	M.	14	12	26	·69	·67	·68
Durban	M.	29	68	97	·36	·78	·58
Capetown	M.	59	84	143	·43	·74	·57
Pietermaritzburg	M.	9	9	18	·43	·51	·47
Bloemfontein	M.	9	12	21	·38	·52	·45
Kimberley	B. of H.	3	10	13	·17	·46	·33

M. = Municipality. B. of H. = Board of Health.

All European rates calculated on population as at Census 1931.
Non-European rates calculated on population as at Census 1921, except Capetown, Port Elizabeth East London and Bloemfontein, which are calculated on population as at Census 1926.

5. *Filariasis.*—Reports have appeared in the English Press of the prevalence of this disease in Natal. It has been stated to have occurred not only around Durban where it is alleged it is frequently overlooked but even in such unlikely places as Basutoland.

One definite case of microfilaria in the urine is reported in an Indian woman who had been five years previously in India. All the indigenous cases of which any details of identification could be got were duly hunted up and subjected to repeated examinations by the Government Pathologist with uniformly negative results.

Reports of filariasis have apparently been made on the strength of conditions resembling elephantiasis and there is no evidence that the disease is indigenous in this country.

6. *Leprosy.*—Tables G (i) and G (ii) indicate the position at the close of the year. It will be seen that a total of 2,144 patients were in the five institutions; 1,605 were probationally discharged; the number of cases in the institutions has decreased by 11 as compared with last year. While the number of Bantu patients still remains high, the European and mixed coloured cases have maintained a low level which was reached about five years ago after a period of consistent diminution. This is a very satisfactory state of affairs if it is remembered that the provisions of the Leprosy Repression Act of the Cape Colony, 1884, were by no means vigorously enforced until very late in the nineteenth century.

In the case of the Bantus, the high number of patients in our institutions is cause for neither alarm nor disappointment, as this is mainly due to early diagnosis. It has always been realised that the success of the Department's policy of compulsory segregation depended largely upon early

diagnosis, but only since the establishment of medical schools in the Union has it become possible to ensure in a practical way the recognition of the disease in its earlier stages. The demonstrations arranged at the Pretoria Leper Institution for parties of students from the Universities of Capetown and Witwatersrand and the post-graduate courses arranged for district surgeons in conuection with these universities, are probably largely responsible for the earlier diagnosis of the condition. There has been a reduction during the past decade of the average duration of the period between onset of disease and admission into an institution, from eight to six years, and with it a very considerable increase in the number of early cases admitted.

On account of these early cases our percentage of discharges has been maintained in spite of an increasing population of advanced cases of the nodular type; these cases which ten years ago formed about one tenth of the institution population now represent approximately 30 per cent. of the inmates.

The probationally discharged cases are kept under surveillance for a period of six years after discharge and the cases which have successfully passed through this period without recrudescence of symptoms now number 1,909.

In the report for the year ended 30th June, 1934, a map showing the relative incidence in the non-European population for the period 1900-1930 was included. In this map each dot represented one case per 10,000 of population, but as it was felt that those unacquainted with the uneven distribution of the population in this country may inadvertently draw erroneous conclusions, on the suggestion of Dr. A. Pijper, a member of the Leprosy Advisory Committee, it was decided to publish the accompanying revised map—see end of Report—in which the population is standardised and each dot represents one case per mille per 100 square miles, thus a small comparatively thickly populated district with a low incidence, e.g. Capetown with an incidence of ·069 per 1,000 p.a., will no longer compare unfavourably with larger but less thickly popuuated districts with a more or less similar incidence, e.g. Barberton and Pilgrims Rest in the Transvaal ·068 and ·076 p.a. respectively. The new figure for charting was obtained thus:—

$$\text{Incidence per 1,000} \times \frac{\textit{Area in square miles}}{100}$$

thus the incidence in Capetown for the period under review is represented by 10 dots, in Barberton by 98 dots and in Pilgrims Rest by 129 dots, giving a true representation of the relative incidence of the disease in that the spacing of the dots is similar in districts of similar incidence.

This map represents some definite features which at present are difficult to explain but which nevertheless call for a short discussion. The relative incidence of leprosy during the period under review was greatest in the thickly populated agricultural areas round the Cape and that part of the Union which lies to the East of longitude 25. This appears in distinct contrast to the complete absence of cases in the Karroo. While the low rainfall may present itself as the obvious explanation for the absence of leprosy in the Karroo, the very low incidence in the Natal coastal belt does not bear out the converse as this happens to be the area of greatest rainfall in the Union.

The District of Klerksdorp is prominent for its very high incidence. It must be explained, however, that this is due to the establishment of a refugee camp in the area during the Anglo-Boer War. There appears to be no obvious reason why the Districts of Vereeniging and Waterberg, and, to a lesser degree, Ventersdorp and Piet Retief in the Transvaal should not conform with their neighbours. The southern districts of the Free State bounding on Basutoland present a similar problem; so does the sparsely populated Van Rhynsdorp District of the Cape with its high incidence, and in contrast the thickly populated area between the Swartberg Range and the South Coast.

It is also noteworthy that on this map there appears to be no association between leprosy and other endemic diseases which tend to undermine the constitution and lower the resistance of the population, e.g. malaria and bilharzia. At this stage it is difficult to explain these and other anomalies. It is probable that the issue is obscured by our having reviewed too long a period on the same map, as it is possible that a wave of infection has spread from the Cape into a virgin soil and that the crest of the wave is reflected at various points. Broadly speaking the one consistent feature appears to be association between the density of the population and the incidence of the disease, with the Natal coastal belt as a notable exception to this generalisation.

The Late Mrs. Franz.—The native population of the Northern Transvaal suffered a severe loss by the passing in July, 1935, of Mrs. H. M. Franz, for so many years matron of the Bochem Hospital. Mrs. Franz had

been trained in nursing in Germay and was a qualified sister of charity. It was in the year 1894 that she and her husband, the late Rev. R. Franz, commenced their work at the Berlin Mission Station at Leshoane, near Woodbush, in the District of Pietersburg. Mrs. Franz had been specially trained in the care of syphilitic cases. She was, therefore, soon to realise what a devastating effect venereal diseases were having on the native tribes of Northern Transvaal. She at once set to work to combat these diseases among them, and soon acquired a deservedly high reputation for her sympathetic and efficient handling of the problem. In 1897 the Franz family was transferred to Blaauwberg, 82 miles north-west of Pietersburg. So firmly established had her reputation become that a large number of native patients followed Mrs. Franz to her new abode. Her reputation spread far and wide, and thousands of natives flocked to her for help. Neither the Rinderpest epidemic nor the Anglo-Boer War diminished the number of natives coming to her for help.

After the Anglo-Boer war this good work came to the notice of the authorities, and Dr. Arnold, who later became Medical Officer of Health of the Transvaal, carried out an investigation regarding venereal diseases amongst the natives in the north. It was thereafter decided by the Colonial Secretary of the Transvaal to establish a hopital in this area aided by the Government. Being a most central and otherwise suitable place, Bochem was chosen by Mrs. Franz with the approval of Dr. Arnold. The buildings were erected during the year 1908, and treatment of syphilis was immediately encouraged by the Government. Mrs. Franz was appointed matron of the hospital with her husband, the Rev. Franz, as the superintendent. Miss J. Schulz, a qualified nurse from Germany, was appointed as an assistant on the nursing staff. The facilities for treatment of venereal and other diseases provided at the Bochem Syphilitic Lazaretto along with the valuable experience of the matron inevitably produced crowding; the hospital soon became inadequate for the housing of the numerous patients, many of whom had come long distances for treatment. Overworked as Mrs. Franz was, she did not fail in her ambition, nor was she discouraged. She worked all the more and appealed to the Government to increase the grant and to build more accommodation. Additions to the hospital were made during the year 1913, accommodation for 150 patients being thereby made available. About that time a commission visited Bochem to inspect the good work that had been carried out. At a meeting with Mr. and Mrs. Franz it was decided to establish a leper institution for native lepers only from all the northern districts. Building of accommodation for lepers was commenced during the winter of 1914, and during November of that year 25 leprosy patients were transferred from the Pretoria Leper Institution to Bochem.

TABLE G (i).—LEPER INSTITUTIONS: PATIENTS THEREIN ON 30TH JUNE, 1935.

Institution.	European.		Native.		Mixed Coloured.		Asiatic.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Persons.
Pretoria.....	65	33	403	248	66	40	3	3	537	324	861
Mkambati.....	—	—	116	105	—	—	—	—	116	105	221
Emjanyana.....	—	—	314	303	—	—	—	—	313	303	617
Amatikulu.....	—	—	222	145	—	—	—	—	222	145	367
Bochem.....	—	—	41	36	—	1	—	—	41	37	78
TOTAL.....	65	33	1,096	837	66	41	3	3	1,230	914	2,144

TABLE G (ii).—LEPROSY: CASES REMAINING IN THEIR OWN HOMES ON 30TH JUNE, 1935.

	Certified and Awaiting Removal to Leper Institution.	Home Segregated.	Probationally Discharged from Leper Institutions.		Total.
			Still under Surveillance.	Released from Surveillance.	
Cape (Province proper).....	—	2	157	385	544
Transkei.....	7	2	530	530	1,069
Transvaal.....	1	1	517	486	1,005
Natal.....	—	—	308	396	704
Orange Free State.....	—	—	93	112	205
UNION.....	8	5	1,605	1,909	3,527

7. *Malaria.—A. Control in Natal and Zululand.*—In the last annual report will be found a full description of the organisation, methods of control and the history of malaria over the preceding five years. Some reference was also made to the exceptional difficulties of last season on account of persistent rains and widespread mosquito breeding. Results proved that, given the right organization, malaria can be prevented from becoming epidemic not only in the limited sugar belt of Natal and Zululand, but also in the far more extensive and difficult native areas where nearly 1,000,000 persons are liable to infection.

This year the results of measures taken are so striking that provided they are kept up we can count on a practical elimination of the disease in the country south of the Umhlatuzi River, in Zululand, and in the controlled area to the north of that river. Except in Northern Zululand, fever this season has been very light and it has been absent from some places in our controlled area for the first time in their history.

There has been no fresh fever this year on the high veld, and anopheles breeding there shows a very restricted distribution as compared with last season. In the larger river valleys, particularly those of the Umgeni, the Umvoti and Tugela, the anopheles population was neither so dense nor so widely distributed as last season. Nevertheless, breeding was general and intense in places. But the number of fever cases was infinitesimal, and bore no relation whatever to the anopheles position.

The coast for 250 miles, from Port Shepstone northwards, is covered by a chain of malaria committees and local authorities, broken at intervals by native reserves. The immediate hinterland is almost entirely native reserve. The whole is under organized control. South of the Umkomanzi River no new infections of malaria were noted and no *gambia* breeding was located. North of Umkomaas to the Umfolosi in Zululand, isolated infections of fever occurred. In no instance was there any spread.

Anopheles breeding occurred over the whole coastal area. Generally, it was less intensive than last season, except in certain of the coastal native reserves, where there is a large population living on cattle. These, having free access to marshy flats, provide innumerable breeding places for *anopheles gambia*, which were almost as numerous as during the previous season. In spite of this, malaria incidence was extremely light and in marked contrast with earlier seasons.

On the coast north of the Umfolosi there was no improvement in the malaria position. In accordance with Professor Swellengrebel's advice, no organized control measures were attempted here, lest such should tend to destroy the degree of natural immunity attained by the native population in this highly malarious area.

The municipalities and boroughs depended for their malaria control mainly on larval control supplemented in every case by spraying of dwellings with insecticide when anopheles had been found. Steady progress was made with permanent drainage in most. Pietermaritzburg Municipality, in addition to its own work, controlled its peri-urban area under contract with Government and kept on its excellent service of health visitors.

The smaller local authorities and malaria committees used the same methods as far as practicable and all malaria committees north of Durban *enforced* a weekly or bi-weekly insecticidal spraying of all habitations. Committees with difficult terrain depended largely on insecticidal work. Where the malaria vectors were *gambiae* and *funestus*, each with different breeding habits, as in the Umfolosi area, the only control attempted was by insecticide. Certain arrangements with malaria committees to control rivers and crown lands have proved satisfactory.

In native reserves situate on coast flats, where anopheles breeding was intense and also those in deep river valleys stretching far into the interior, malaria control presented special features of interest. It was found in 1931 when the present epidemic was only in its second season that it was impossible to institute any effective anti-larval control in native reserves on account of prejudice. Natives feared Government interference with water supplies and movements of cattle. Co-operation could not have been got nor could adequate supervision over the 2,000 square miles of country now handled have been maintained. At that time our main problem was to induce the intelligent use of quinine. It was thought, however, that natives might permit fumigation of huts and it was possible to obtain sufficient sulphur to institute systematic treatment of the huts of a difficult tribe in the Tugela back blocks. As an anti-malaria measure sulphur fumigation of grass huts proved a failure, but the procedure made an instant appeal to the native imagination and was enthusiastically taken up.

We had arrived at a practical method for native areas if it could be shown that reliable insecticide used systematically would give effective

malaria control. A beginning was made in the 1932-33 season in the native district of Umsinga, using a reliable pyrethrum insecticide. Every hut in a section of the district was sprayed weekly. There was a marked reduction in the incidence of fever, and a demand from other parts to have the system extended to them. Later, in the same season, the coast malaria committees found themselves unable to control the disease by anti-larval methods alone, and, on the advice of the Department, instituted insecticide spraying of all dwellings, including the barracks which house the large labour force employed in the sugar industry.

During the 1933-34 season spraying of habitations was systematised in the reserves as described in last year's report. In malaria committee areas it is now entrenched by legislation, and every committee uses the method as part of its ordinary routine. On account of the ease of application and the low cost some would like to rely solely on insecticidal work, but that cannot be recommended where anti-larval work is a practical proposition as in closely settled communities. Over a large part of the country and particularly in native reserves, anti-larval measures are quite impracticable specially in wet seasons. Without insecticidal work, one would have to rely mainly on medication which, even in a malaria-minded population as ours has become, could never be depended on to eliminate the disease.

We have been driven to employ hut-spraying during the malaria season as our main weapon over extensive sections of the country, and after a two-years' trial on the large scale are satisfied that the disease can be controlled by it in Natal and Zululand.

It is essential, however, that—

(*a*) hut-spraying commence as soon as adult *gambia* or *funestus* begin to enter dwellings;

(*b*) it be applied to every habitation over the area to be dealt with, and that such area be as large as possible;

(*c*) every dwelling be thoroughly sprayed at least once weekly, but preferably bi-weekly.

During the 1933-34 season, with mosquito-breeding well-nigh uncontrollable, hut-spraying was undertaken on a very large scale. There were gaps in the organization, particularly in some malaria committee areas where those in charge had difficulty in bringing all employers of labour into line.

Where spraying was perfunctory or omitted altogether, outbreaks of fever occurred. In every case, treatment of patients, plus systematic spraying of barracks for the rest of the season, stopped further incidence of fresh cases.

During the dry winter season, arrangements were made to treat recurring cases of fever in all the native reserves. Huts where these occurred were searched and kept sprayed if *gambia* was found. Search was made for larvae and breeding places sprayed, if feasible.

At the beginning of the present season, certain outbreaks occurred. Cases were at once treated and huts, for a mile all round, were kept sprayed until *gambia* could no longer be found.

While successful control by insecticidal methods is claimed, it is not suggested that such is produced by a diminution of the numbers of anopheles. It is rather an effect of a reduction of the infectivity rate of the mosquitoes. Our method can only be successful when the vectors are in the habit of frequenting houses. Reduction in the infectivity rate may be very marked. For anopheles gorged with human blood during the height of the season it was found to be below 1-1,000 in native areas formerly badly affected by malaria and it is believed that by systematic spraying in succeeding years we may be able to keep it at that rate or lower.

This aspect of the malaria problem will be the subject of a detailed report by officers of the South African Institute of Medical Research, who have for the past six months been studying the effects of our measures in selected areas.

There is another good effect, not foreseen at the commencement. Many natives, formerly hostile to any interference with the terrain by draining or treatment of water, have now become firmly convinced that fever is synonymous with a failure to control anophelines (which they recognise), and they have begun by draining and by restricted oiling to limit anopheles breeding.

Further, it has been possible to induce certain progressive natives to plant gums (*E. saligna*) on seepages near their kraals, a movement which is encouraged by the Native Affairs Department, but for the successful treatment of large areas more systematic work is required. That Department has accordingly set aside an annual sum for the establishment of plantations

at places selected in conjunction with Health Department officers, a species of forestry which promises to be most useful both from the health and economic point of view and should be encouraged.

The Department is able to congratulate the several local authorities and particularly the malaria committees on their work during the year and it is confident that, given the close co-operation which exists to-day between its own officers and theirs, coupled with the maintenance of the Department's organization in the native reserves, the danger of epidemic malaria in controlled areas is past and its practical elimination over considerable sections of the country is in sight.

The Department's malaria staff comprises one senior assistant health officer, one assistant health officer, the Government Pathologist, and four laboratory assistants who devote part of their time to malaria work; a medical officer, senior inspector, 8 European inspectors, 52 trained native malaria assistants, and 38 sprayers who are engaged entirely in malaria duties.

Local authorities have their own staffs numbering approximately 130 Europeans and 250 natives (mainly untrained). These work in close co-operation with the Department's staff. Outside local authority areas and in native reserves the Department takes charge either directly or through magistrates.

It should be borne in mind that, except in the case of the large local authorities and two malaria committees which undertake complete control, the responsibility for doing anti-malaria work rests on the individual. The large estates provide themselves with their own staffs, most of which have been trained by the Department which exercises general supervision and maintains the closest contact.

B. *Tzaneen Field Station.*—The Malaria Control and Research Station continues to render valuable service, working in close conjunction with the Entomological section of the South African Institute for Medical Research. This section has now been transferred to Natal. This transference has necessarily made it impracticable to carry on as much purely research work at this station as heretofore. Nevertheless the habits of the two known anopheline vectors of malaria in the Union are still being carefully observed. This work confirms the view that *A. gambia* and *A. funestus* are the only two species which, under natural conditions in the Transvaal, transmit malaria to man. It is, however, coming to light that *A. funestus* is a composite species with races which cannot be differentiated morphologically, but which nevertheless show physiological and other differences. By investigating carefully these differences it has been possible, for example, to establish the existence of the sub-species *Funestus leesoni*.

In the bushveld area of the Transvaal malaria occurs not continuously during the summer, but in definite epidemics. The mosquito vector responsible for these epidemics is the *Anopheles gambia* (*costalis*). It breeds up rapidly after rainfalls in summer. Because of this it is possible to foretell with a considerable degree of accuracy when an epidemic is due. The recording of the rainfall at various strategic points is, therefore, important. It was arranged to get this meteorological data in the form of weekly reports from police posts in the regions most subject to these epidemics. The information is carefully correlated, and the deductions regarding the probable outbreaks of malaria (where adequate anti-mosquito measures are not taken) are broadcast. This information proved of considerable value during the past malaria season.

The work of the lady health visitors is beginning to bear good fruit. They combat malaria to a large extent indirectly, but none the less effectively, by educating the women in the rural homes in general hygiene, more particularly in dietetics and the proper care of infants. They are also being very successful in getting the male head of the household to render his home mosquito-proof and so more directly attack the problem of *mosquito* prevention.

A course of training in malaria prevention was again given to teachers and others interested. This class is held early in the calendar year. The Transvaal Education Department provides financial assistance, and issues certificates to its teachers who after duly performing the course are successful at the examination held at its completion. Hitherto the class has been held only at Tzaneen. Next year it is hoped to hold a class also at Nelspruit, so that the teachers in that region may also be put in possession of indispensable knowledge regarding malaria-prevention in our fever-ridden areas.

C. *Railway Areas.*—The importance of malaria along railways in those parts of the Union where this disease occurs, warranted the appointment three years ago of a full-time medical officer devoting practically the whole of his time to the combating of this disease. This appointment was made

on the recommendation of Professor Swellengrebel, who advised the Government as to its malaria policy. Dr. Booker, the officer appointed, was subsequently made an Assistant Health Officer of the Public Health Department seconded to the Railway Administration. It was soon found that the anti-malarial work of the Railway health staff could conveniently be combined with other health work. The Assistant Health Officer now advises on all Railway health matters. His full report for the year under review is published as Annexure D.

In the section on malaria, the extensive measures that have been adopted by the Railway Administration are detailed. The very satisfactory results are clearly brought out by the tabulated figures in this section.

8. *Plague.*—A heavy toll was taken by plague during the year. The mortality among veld rodents was enormous and the incidence among human being at times gave rise to fear in certain localities of the disease assuming epidemic proportions. The long period of years during which only relatively few human cases occurred each summer had, however, served a very useful purpose. Even the most inert of local authorities had, because of the constant reminder of the plague menace, taken some precautionary measures against rodent infestation. In the larger urban areas rats had to a very considerable extent been " built out " of stores and other buildings which in earlier years had provided extensive harbourage for these animals. The result was that in spite of what was probably the worst plague epizootic that had occurred among our rodent population during recent times the urban local authorities were hardly affected at all. It must, however, be admitted that in the case of a few local authorities which had taken practically no precautions this was to be attributed to good luck rather than to good management. This remark particularly applies to Bloemfontein which appeared ripe for an explosive outbreak during the year. This local authority has usually been most energetic in carrying out necessary sanitary measures, but it had always systematically ignored the requirements of the rat-proofing regulations and repeatedly shelved the recommendations of its own medical officer of health in regard to their enforcement. During the year, therefore, it became necessary, in view of the virulent epizootic around Bloemfontein and the extreme infestation of the town with rodents, for the Chief Health Officer on two occasions to visit Bloemfontein to make it clear to the local authority that the Department was not prepared to allow the position to continue. As a result of his interviews with the Council the regulations are now being enforced, and it is to be hoped that during the next two years, whilst buildings are being rendered rat-proof, the good fortune of the inhabitants in avoiding infection will still continue.

The epizootic among veld rodents generally was not by any means unexpected. In the Orange Free State, the summer of 1933-34 had been particularly favourable for the growth of the grasses on the seeds of which the gerbille depends for its existence. The rodent officers of the Department in that Province reported on the rapid increase taking place among these prolific mammals. In its health bulletin for the week ended 10th November, 1934, the Department drew the attention of the public to the enormous increase that had taken place among the veld rodent population of the Orange Free State during the previous eighteen months, and to the fact that waves of plague infection were occurring amongst them in various districts. The bulletin stated further:—" It is not unlikely that domestic rodents may become infected during the course of the present epizootic resulting in a considerable prevalence of plague amongst human beings ". This prophecy was to be proved all too true within two months.

The outbreak among humans began seriously in January. In the bulletin for the week ended 12th January, 1935, 15 cases, all fatal, were announced from two districts in the Orange Free State—Jacobsdal and Boshof. The opportunity was again seized, as in November, before any human cases had actually occurred, for urging local authorities and householders generally to take all possible measures to guard against the danger by keeping their premises free of rodents. The outbreak as it affected human beings is summarized in Table H (i).

TABLE H (i)—PLAGUE CASES AND DEATHS IN THE UNION DURING THE YEAR ENDED 30TH JUNE, 1935.

Province.	Number of Districts in which Outbreaks Occurred.	European.		Coloured or Native.		Total.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cape	4	—	—	59	31	59	31
Natal	—	—	—	—	—	—	—
Transvaal	3	1	1	33	11	34	12
Orange Free State	21	25	16	172	125	197	141
UNION	28	26	17	264	167	290	184

It will be seen that the Orange Free State was by far the most severely hit, as was to be anticipated from the great multiplication of veld rodents in that Province during the previous summer and the waves of plague known to have been occurring amongst them. The epizootic flared up simultaneously at various points among these veld rodents; this accounted for its widespread but very irregular distribution. Its progress from these foci was slow when compared with the rapidly spreading waves of infection to which we have grown accustomed in previous epizootics. Rodent surveys in the Orange Free State not infrequently revealed quite late in the season areas where the rodent population was still quite healthy, while in adjoining areas very extensive mortality was occurring. A satisfactory explanation for this is not readily to be found, particularly as in many of the healthy areas plague destroyed the veld rodents later so that it was not a question of immunity being established.

In Table H (ii) the distribution of human cases is set out in greater detail. It will be seen that the main incidence was in the south-western portion of the Orange Free State where the Namaqua gerbille is plentiful, and into which the area occupied by the lobengula gerbille also extends. Notwithstanding the widespread distribution of plague infection among these rodents, the human outbreaks occurred comparatively infrequently and often at considerable distances and times apart. The relative freedom of the northern portion of the Orange Free State is to be correlated with extensive destruction of veld rodents in that area during the previous epizootic. Numerous farms on which infection among veld rodents was found escaped without any human cases. In proportion to the extent of the rodent epizootic the number of farms to suffer was suprisingly small. This must be attributed to the relative freedom of infection among imported domestic rodents. The main intermediary between gerbille and man was, as in previous outbreaks in the northern provinces, the multimammate mouse, but in a few instances, *rattus rattus* also became infected and was responsible for the human cases.

TABLE H (ii)—DISTRIBUTION OF HUMAN PLAGUE AMONG THE DISTRICTS OF THE THREE AFFECTED PROVINCES.

Province.	European.		Non-European.	
	Cases.	Deaths.	Cases.	Deaths.
Orange Free State Province.				
Bloemfontein	1	1	34	28
Boshof	8	5	23	12
Jacobsdal	6	6	18	15
Heilbron	3	1	15	10
Brandfort	3	1	14	10
Thaba 'Nchu	—	—	12	6
Kroonstad	1	—	10	9
Senekal	—	—	10	10
Bothaville	—	—	8	2
Fauresmith	2	1	5	5
Koffiefontein	1	1	5	2
Smithfield	—	—	3	3
Winburg	—	—	3	2
Hoopstad	—	—	2	2
Tromspburg	—	—	2	2
Zastron	—	—	2	2
Rouxville	—	—	2	1
Clocolan	—	—	1	1
Edenburg	—	—	1	1
Philippolis	—	—	1	1
Vredefort	—	—	1	1
21 DISTRICTS	25	16	172	125
Cape Province.				
Glen Grey	—	—	37	15
Herschel	—	—	11	8
Aliwal North	—	—	9	6
Williston	—	—	2	2
4 DISTRICTS	—	—	59	31
Transvaal Province.				
Ventersdorp	—	—	21	8
Marico	1	1	10	2
Verecniging	—	—	2	1
3 DISTRICTS	1	1	33	11

As the outbreaks developed, the rodent staff of the Department became inadequate to cope with them. Additional men were trained in deratting work and posted to various parts of the Orange Free State and the Transvaal.

In the Marico District, in the Transvaal, the rodent infection spread alarmingly through a thickly populated native location. The huts did not permit of fumigation except at great expense of time and money. They were, therefore, dealt with by dusting the floors with cyano-dust and subsequent flaming with a blow-lamp. Some 850 huts were dealt with in this manner very expeditiously and economically. The rodent staff, under the direction of Dr. L. Fourie, have continued to test out new methods of deverminization which are continually being devised by themselves and by firms selling this kind of material. A much advertised method consisted of the generation of carbon monoxide from waste rags and bags. At the request of the manufacturers, the pump specially designed for the purpose was extensively experimented with as it seemed to offer a cheap and easily available method. It was, however, found ineffective, as there was no certainty of killing either the rodents or their fleas. The use of calced briquettes applied to rodent burrows by means of a rotary duster, was also tested. The results were promising, only the briquettes are not sufficiently solid, which means that excessive quantities of material must be used in the gassing of burrows. It is understood that a new duster is being designed to meet this defect.

The outbreaks were everywhere exploited by the officials dealing with them for propaganda purposes. This is rendered necessary by the entire lack of enthusiasm for anti-rodent measures in most parts of the country during the absence of cases of human plague. It has always been found difficult to induce the smaller local authorities to adopt active campaigns, particularly in connection with the " building out " of rodents from stores and dwellings. In the Marico District, meetings of natives were held in all the main reserves. At these meetings demonstrations of the measures used for rodent destruction were given. At several of the reserves, pumps for applying the rodent poison were purchased. Such natives will, in future, be able to carry out the anti-rodent measures necessary for their protection against plague.

In the Cape Western area, where plague has for many years been enzootic over a very extensive area, no human cases occurred. This must again be attributed largely to good fortune, since the anti-rodent measures adopted by many local authorities and private individuals in the countryside still leave very much to be desired. The belts of country which are being kept rodent-free with a view to protecting, in particular, the Cape Peninsula, have been continued. These belts are at strategic places, such as Piquetberg and Worcester Districts. The postponement of the passage of rodent plague infection to the most southerly points must be attributed largely to these measures.

Very active measures were adopted during the year by the South African Railways and Harbours Administration. These are described in detail in the annual report of the Union Assistant Health Officer for Railways, Dr. C. G. Booker, whose report appears as Annexure D.

Of some scientific interest is the occurrence of natural plague in a cat, the dead body of which was sent for examination to the South African Institute for Medical Research from the Zastron District. Biological tests for plague proved positive.

There have hitherto been very few thoroughly authenticated cases of natural bubonic plague in cats in connection with plague in veld rodents though it was common enough in the days of plague in South Africa when the disease occurred amongst house rodents in the large towns.

9. *Rabies.*—Although only three human deaths (two European and one native) occurred during the year from rabies, the infection among our small wild carnivores is known to be spreading steadily. Several such animals were proved by pathological examination to have died from this cause. The animal chiefly responsible for human infection continues to be the mungoose which were responsible for two of the three human cases reported last year, the third resulting from the bite of a domestic cat.

Infection among these small wild rodents which include in addition to the mungoose, the suricate and the small-spotted genet occurs over a wide area of the Union, extending roughly from a line joining Carolina and Vryburg in the north to one joining Cradock and Carnarvon in the south.

In April a detailed pamphlet on rabies was published jointly by the Secretary for Public Health and the Director of Veterinary Services. In this full information is given of the occurrence of the disease with descriptions and pictures of the wild animals known to be carriers of infection, mode of transmission, symptoms, diagnosis, the procedure for collection of material for laboratory tests, preventive measures and treatment.

It is intended primarly for the information of magistrates, district surgeons, veterinary officers and local authorities. It should prove valuable also to teachers and others in authority who are in a position to warn persons in the affected area of the danger of infection and the precautionary measures which should be adopted.

10. *Sleeping-sickness or Human Trypanosomiasis.*—The danger of introduction into the Union of sleeping-sickness from our northern neighbours has constantly to be borne in mind, and an alert policy is adopted by the Department. Under the Public Health Act it is defined as one of the formidable epidemic diseases concerning which special powers are provided and duties imposed on the central and local governments. Regulations have been made under the empowering section of the Act. These were rendered necessary because in part of Natal, *Glossinae*, or tsetse flies, capable of carrying infection are known to exist. Persons believed to be harbouring trypanosomiasis infection are under no circumstances allowed to enter the part of Natal known as the quarantine area. This danger zone is exactly described in the regulations. Persons from infected areas are not allowed to enter our quarantine area unless in possession of a special permit. Provision is also made in the regulations for prompt reporting and isolation of cases or suspected cases.

These precautions were recently shown to be very necessary when persons were found to be suffering from acute trypanosome infection in the Chobe District of the Bechuanaland Protectorate. The infected region is in a recognised fly-belt area and sufficiently near to the Union border to justify careful watching.

11. *Smallpox.*—This disease continues to occur in a mild form, particularly among natives who refer to this attenuated infection as Amaas. It must always be borne in mind though that this mild infection is liable to become virulent smallpox should it infect an unvaccinated person. An alert policy is, therefore, necessary. If it were not for extensive vaccination of the population, the disease could easily assume epidemic proportions in a very virulent form. Seventeen small outbreaks were reported during the year affecting one European and twenty-eight natives. None of these cases was fatal. They are set out in Table J. The districts in which these outbreaks occurred were Beaufort West, Cathcart, Jansenville and Maraisburg, in the Cape; Bothaville, Ficksburg, Fouriesburg, Senekal, Winburg, in the Orange Free State; Lydenburg, Middelburg, Marico, Pietersburg, Standerton, Waterberg, in the Transvaal; and Alfred, in Natal.

TABLE J.—SMALLPOX: CASES AND DEATHS REPORTED DURING THE YEAR ENDED 30TH JUNE, 1935.

Province.	Number of Districts in which Outbreaks Occurred.	European.		Non-European.		Total.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cape	4	1	—	9	—	10	—
Natal	1	—	—	3	—	3	—
Orange Free State	6	—	—	7	—	7	—
Transvaal	6	—	—	9	—	9	—
UNION	17	1	—	28	—	29	—

The active enforcement of legislation in regard to vaccination has been continued. Tables summarising the position will be found in Annexure E.

12. *Tuberculosis.*—The urgency of the tuberculosis problem was referred to in the introduction to this report. As mentioned there, a commencement has at last been made with an investigation into the significance of milk-borne infection, particularly in children.

The extent to which tubercle infection occurs in the Union is not accurately known. Notifications of the disease are somewhat defective, and their number gives an erroneous idea as to the prevalence. The cases notified during the year are set out in Table K (i) and are seen to total 8,896. This is a striking increase on the number notified last year, 7,663, which in turn was 1,214 higher than that of the year before, and 1,515 over the year ended June, 1931. A small portion of this increase may be attributed to better notification resulting from improvement in diagnosis. There can be little doubt, however, that there has been a steady increase in the incidence of the disease. As infection may take some time to manifest itself

the present increase must still be attributed to the effects of the economic depression with its evil effect on the food and housing conditions among the poorest classes of the community.

TABLE K (i).—TUBERCULOSIS: NOTIFICATIONS DURING THE YEAR ENDED 30TH JUNE, 1935.

	European.	Non-European.	Total.
Cape (excluding Transkei)..	492	3,683	4,175
Transkei	—	1,758	1,758
Transvaal	130	1,453	1,583
Natal	99	1,090	1,189
Orange Free State	14	177	191
UNION	735	8,161	8,896

The death rates from tuberculosis for Europeans in the Union is shown in Table K (ii). For 1933 it was 40·68 per 100,000, which is a small but definite drop as compared with previous years. Our drop in tuberculosis mortality compares very badly with that for England and Wales. In those countries, the institution of suitable measures by the Government has reduced their death-rate by one-half during the past twenty years. In the Union, over the same period, it has only dropped from 51 in 1913 to 41 in 1933. Our figures apply only to Europeans. It is probable that if Bantu statistics could be included little, if any, drop in mortality would be revealed. Owing to the almost complete absence of vital statistics regarding out native population, the death-rate among them is impossible of assessment. This difficulty arises again and again in public health administration in the Union, and strikingly illustrates the necessiy of securing a proper system of vital statistics among non-Europeans.

Table K (ii).—Death Rates from Tuberculosis per 100,000 of Population—Europeans only.

Year.	Cape.			Natal.			Transvaal.			Orange Free State.			Union.		
	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.	M.	F.	P.
1912	70·55	44·83	58·11	85·84	62·66	75·03	55·97	26·97	43·14	29·58	28·09	28·89	61·10	38·32	50·49
1913	70·19	53·93	62·31	81·15	52·19	67·60	57·61	22·43	41·88	29·54	24·13	27·02	61·21	39·67	51·13
1914	60·82	40·27	50·85	83·59	32·85	59·80	57·60	25·42	43·08	28·44	14·31	21·81	57·26	31·39	45·10
1915	56·42	40·43	48·64	69·37	33·52	52·52	60·69	21·73	42·95	19·98	25·92	22·78	54·26	31·76	43·63
1916	42·31	44·91	43·58	75·22	35·95	56·72	72·37	33·91	54·71	27·30	16·30	21·99	53·91	36·77	45·78
1917	64·12	51·27	57·53	66·75	38·21	53·28	70·23	22·42	48·09	37·75	16·12	27·44	63·18	35·55	50·02
1918	52·07	39·25	45·81	64·87	46·97	56·39	76·62	21·28	50·80	37·65	18·20	28·33	60·24	31·06	46·28
1919	41·56	49·23	45·32	57·63	30·66	44·73	82·21	13·39	49·82	43·60	12·37	28·61	57·95	30·55	44·77
1920	52·55	39·07	45·94	73·70	43·50	59·14	72·91	19·73	47·70	45·30	17·79	32·08	60·92	30·07	46·00
1921	36·99	64·06	60·48	74·93	24·00	50·21	102·08	22·70	64·22	54·13	23·12	39·20	74·65	40·87	58·26
1922	61·70	55·91	58·84	35·64	11·54	23·90	75·78	22·41	50·24	20·07	19·52	19·81	59·27	35·56	47·74
1923	55·03	52·43	53·74	41·62	40·45	41·05	74·45	21·12	48·77	19·91	17·17	18·59	56·53	35·91	46·46
1924	67·04	52·82	60·00	50·93	36·38	43·77	84·54	23·41	55·01	14·71	22·25	18·33	65·47	37·08	51·59
1925	65·65	62·14	63·91	73·89	40·51	57·42	74·27	21·84	48·87	30·01	12·59	21·65	65·19	39·68	52·70
1926	58·97	57·36	58·18	49·23	39·85	44·64	95·54	24·41	61·09	24·89	16·22	20·68	67·29	38·90	53·41
1927	61·36	59·87	60·62	71·95	28·73	50·78	78·78	17·87	49·20	24·58	12·98	18·94	64·30	36·10	50·50
1928	60·72	56·51	58·64	54·99	25·55	40·56	85·08	20·74	53·75	31·76	15·74	23·96	65·61	35·69	50·95
1929	57·98	51·63	54·85	44·58	22·56	33·78	72·48	18·08	45·95	22·16	17·47	19·87	57·70	32·54	45·37
1930	62·20	50·58	56·46	51·74	31·51	41·81	73·84	18·96	47·09	23·47	6·87	15·36	61·05	31·96	46·78
1931	55·79	55·75	55·77	54·26	26·34	40·54	64·26	15·05	40·33	24·81	11·92	18·49	55·41	32·62	44·22
1932	51·02	54·55	52·77	58·63	24·66	41·92	59·19	16·40	38·37	20·02	15·83	17·96	51·49	32·84	42·33
1933	57·48	54·40	55·95	46·86	18·64	32·96	52·21	14·58	33·88	22·86	6·90	15·01	50·60	30·44	40·68

Prior to 1921 certified deaths only were included.
M. = Males; F. = Females; P. = Persons.

In last year's report the national scheme which had been formulated for dealing with tuberculosis was announced. Active steps have now been taken for pushing forward this scheme. Valuable help has been provided to local authorities by the Public Health (Amendment) Act, 1935. This makes the local authority responsible for only 25 per cent. of the cost of dealing with tuberculosis patients, 50 per cent. being provided by the State, and 25 per cent. by the Provincial Administration. The arrangements for the expansion of the sanatorium at Nelspoort are well in hand. The additional European ward to provide thirty beds is to be put to tender, and it is anticipated that the work will be completed before the end of the year.

It is also proposed to build another block for the accommodation of native and coloured patients, and the necessary provision is being made on next year's estimates.

At Rietfontein, plans and specifications have been prepared for the new hospital wards for chronic and acute non-European cases, and tenders have been invited. It is hoped that the work will be completed within the next twelve months.

After careful consideration of the requirements of Port Elizabeth and the Eastern Province generally, it was arranged by this Department and the local bodies concerned to erect on the site of the old infectious diseases hospital at South End, Port Elizabeth, a new isolation hospital consisting of fifty beds for infections diseases cases and seventy-five beds for cases of pulmonary tuberculosis, incorporating any of the existing buildings on the site considered suitable for the purpose. Plans for the entire services have been prepared and it is anticipated that the work will be undertaken forthwith.

The object of the tuberculosis portion is to provide accommodation for cases requiring investigation prior to transfer to a sanatorium for further treatment and for the accommodation of such patients unsuitable for sanatorium treatment.

In Durban, a site given by the corporation for the new tuberculosis hospital has been approved and plans have been prepared. Building is to commence shortly. The visit of Miss Riemerschmidt of the Institute of Therapeutic Research of the University of Jena, was used for assessing the therepeutic value of solar radiation at this site. The measurements she took have not yet been fully analysed, but they indicate clearly that from the sunlight point of view the site is satisfactory. The Natal Tuberculosis Association has been most active throughout the year and has overcome all public prejudice against a site for a tuberculosis hospital in the coast belt. It has become increasingly apparent that the success or otherwise of anti-tuberculosis work in Natal is going to depend largely on the effective functioning of the tuberculosis clinic and particularly the after care arrangements. The cases, including the bulk of the natives, will probably come from the urban and peri-urban areas. It is becoming increasingly clear to the Anti-Tuberculosis Association and to the Department that the effective handling of tuberculosis in the province is going to depend to a large extent on the officer placed in charge of the hospital, who will be regarded as the Tuberculosis Officer for Natal. Unless there is a systematised follow-up directed from a central organisation, much of the good work done at the hospital will be wasted, as cases will not be followed up by leaving it to local authorities or even magistrates. That a system comparable to that in vogue for lepers is an absolute necessity is recognised by the association, which is beginning to appreciate the fact long known to the Department's officers that hospitalisation and sanatorium are really a mere episode in a patient's treatment, although admittedly an important one from an educational point of view.

It is being realised that the real tuberculotic problem of Natal, even from the point of view of the European tuberculotic, is the focus of infection provided by the non-European, and it is certain that the numbers of the latter greatly exceed the former. Certain towns are trying to estimate the numbers of these in their slum areas. This can best be done by health visitors. A great many towns have black belts just outside their boundaries where nothing is done and no sanitary control is instituted, and there the tuberculotic goes unchecked. There is, also, the infinitely greater native area where widely differing reports have been received as to incidence; most of these reports are founded on native hearsay, a perfectly useless and misleading form of information.

Nelspoort Sanatorium continued to do valuable work. Three classes of patients are admitted—

(1) *Free Patients.*—Quarter of the cost of treatment is paid by the local authority and quarter by the Provincial Administration concerned, the remainder being paid by the Department of Public Health.

(2) *Part-paying Patients.*—In this case the patient pays a contribution towards the cost of his treatment, the balance being paid in the same proportions by the authorities above mentioned.

In these two classes of patient, application for admission must be submitted by the local authority, which guarantees payment of the agreed amount in each case. The tariff per patient per day is fixed periodically by the Treasury on the advice of the Advisory Committee—representing the Cape local authorities, the trustees of the late Mr. Garlick, and the Government.

(3) *Full-paying Patients.*—The institution was not intended for full-paying patients, but as in the early years the other classes of patients did not take up all the beds, and as applications were received from people willing to pay the full rates, such patients were admitted at a tariff of 12s. 6d. a day.

The following table summarizes the work of the institution during the year:—

TABLE K (iii).—ADMISSIONS, DISCHARGES AND DEATHS DURING THE YEAR ENDED 30TH JUNE, 1935.

	Total.	European.			Non-European.		
		Male.	Female.	Total.	Male.	Female.	Total.
In Sanatorium on 1st July, 1934	96	29	32	61	17	18	35
Admitted during year.....	272	89	76	165	53	54	107
TOTAL.....	368	118	108	226	70	73	142
Died during year.....	8	—	1	1	5	2	7
Discharged during year.....	263	87	76	163	47	53	100
TOTAL.....	271	87	77	164	52	55	107
In Sanatorium on 30th June, 1935	97	31	31	62	18	17	35

The patients admited during the year were in the following stages of the disease:—

Race.	*Stage I.*	*Stage II.*	*Stage III.*
European	16·97 per cent.	52·73 per cent.	30·3 per cent.
Non-European ...	20·6 per cent.	43·9 per cent.	35·5 per cent.

Of the 272 admissions during the year, 237 were free, half their cost being paid by the local authority and half from the Department's vote, 15 were part-paying or contributing, and 20 were full-paying patients.

The average stay of patients in the institution was: Europeans, 136 days; non-European, 114 days.

Miners' Phthisis Beneficiaries.—A committee was appointed on 31st July, 1934, by the Honourable the Minister of Mines to inquire and report on the present circumstances of men living in South Africa who have received compensation under the Miners' Phthisis Act in respect of the ante-primary stages of Miners' Phthisis, or of simple silicosis, and who are at present unemployed and are not qualified to obtain a monthly allowance other than *ex gratia* grants under these Acts—in particular to ascertain how many are capable of being employed and how many are, through age or infirmity or other cause, not capable of employment. It had further to inquire into and report upon what occupations on the scheduled gold mines of the Witwatersrand were suitable and should be made available for the employment of such of these men as were fit to work, and what practical steps could be taken to secure that such appointment would be found either in the occupations mentioned above or in suitable occupations elsewhere. The beneficiaries to be considered were those who received definite sums of money as compensation and excluded those drawing pensions.

The committee reported that there was considerable distress and unemployment among non-pensionable beneficiaries living in South Africa.

At present some relief is given by *ex gratia* grants made under authority of section 13 of Act No. 60 of 1934.

Various organisations exist for the purpose of promoting employment of beneficiaries, viz. :—

(1) The Miners' Phthisis Board.

(2) The Joint Advisory Committee for the furtherance of employment of Silicotic Beneficiaries.

(3) The " Internal Committee " of the Gold Producers' Committee of the Transvaal Chamber of Mines.

Other organisations such as the South Africa Mine Workers' Union and the Underground Officials' Association also do work in this direction.

The *number of beneficiary miners* resident in South Africa, who were not in receipt of pensions but who had been granted benefits by the Miners' Phthisis Board, was 4,116 at 31st July, 1934. Of these 442 had not communicated with the Board for three years. The number not capable of ordinary employment totalled 910 of whom 526 had been certified as unfit by the Medical Bureau Medical Appeal Board, and 384 were over sixty years of age. Some of these beneficiaries had, however, secured employment :—

Employed on Mines	127
Given Special Grants	452
Refused Special Grants	64
Circumstances unknown to Board	267
	910

The 384 beneficiary miners who were over 60 years of age had not been certified as unfit on account of disabilities, but great difficulty was found in obtaining employment for men of 60 years and over.

Beneficiary miners found fit for ordinary to moderate work numbered 1,396, distributed as follows :—

Employed on Scheduled Mines	709
Employed on Non-scheduled Mines	409
Employed on Associated Industries of the Scheduled Mines	98
Employed by Municipalities, S.A. Railways, Relief Works, Road construction, etc.	180
	1,396

Beneficiary miners who were presumably out of employment and unemployable totalled *600*, of whom *340* were on the employment register of the board and were in receipt of special grants, 60 were on the register but were not receiving special grants, while in 200 cases applications for special grants had been rejected on various grounds, although it is stated that most of these men were merely " eking out an existence ".

Beneficiaries who had not been registered in the office of the board during the past three years numbered 1,157. Of these 715 had been in communication with the board during the past three years, but the remaining 442 had not done so.

Beneficiary miners who, owing to bad character, inebriety, etc., could not be employed totalled 53.

The committee examined the possibilities of various possible occupations, which could be regarded as suitable for the particular classes of silicotics under review, and recommended a list of occupations which should be reserved or made available for these men.

The question of allowing additions to the articles of produce, which fruit stall holders in compounds were allowed to sell, was considered, but difficulties were experienced about the limit to be fixed so that other interested storekeepers should not be harmed. The committee was only able to say that mine compound fruit-stall holding was regarded as a suitable occupation for silicotic unpensioned beneficiaries and, subject to due consideration of the interests of others who trade with mine natives, this occupation should be encouraged for them.

The committee considered that care should be taken not to alienate the goodwill of employers by bringing in any form of compulsion in getting employment for silicotics.

From the information supplied, the committee regarded the difficulty in absorbing employable silicotics as one which will, in time, disappear, and the aim is to tide over the intervening period. The reasons for this statement are fully set out. They are based on the following facts :—

(1) The number of new cases is less than those who have died or have progressed to a stage when they are entitled to pensions.

(2) Recent legislation has allowed miners with ante-primary silicosis to remain in under-ground work in scheduled mines longer than three months, so that miners will continue at work until they reach the secondary stage.

(3) Special authorisation certificates can now be issued under the recent amendment of the Miners' Phthisis Act permitting beneficiaries who have been found by the Medical Bureau not to be suffering from silicosis or tuberculosis although they were so certified under the panel system in the past.

(4) More beneficiaries are being employed on scheduled mines. 854 were employed in June, 1933, and 984 in May, 1934.

(5) Owing to the increased activity and scale of mining on the Witwatersrand there are more openings.

(6) Similarly, the non-scheduled mines are able to absorb more beneficiaries owing to increased activity.

The committee was of opinion that unless there is some unexpected and severe set-back in the progress of mining, it would be possible to provide employment for all capable silicotic beneficiaries in the course of the next few years.

All the foregoing refers to silicotics but the committee made a few recommendations regarding the employment of tuberculotics. It considered that owing to the very limited field of employment of tuberculotics, employers should be encouraged to give them preference even over silicotics in the particularly light jobs for which they are suitable.

13. *Typhus Fever.*—Typhus fever has for a very long time been endemic in the Native areas of the eastern Cape Province. The numbers of cases reported must always have greatly underestimated the actual incidence. This must have been specially true in the earlier years. But even now notification of morbidity and even mortality is very incomplete. Headmen of kraals seldom report outbreaks unless cases become serious and deaths occur. One generally finds when investigating outbreaks many unreported cases of which the Headmen themselves were unaware. This is almost unavoidable in an unorganised community living under uncivilised conditions. From 1919 to 1923 virtually epidemic conditions prevailed, the average number of cases reported annually in the Union exceeding 8,000. The great bulk of these cases occurred in the eastern Cape. Of the 11,000 cases reported in 1920, nearly 10.000 came from this region. During this period a large proportion of the susceptible native population must have become immunised. By 1924, as will be seen from Table L (i), the number of reported cases had fallen to 2,000, a figure which was not again reached until 1933. The present increase may be attributed to the wearing off of the extensive immunity acquired during the epidemic period, as well as the increasing stress of economic conditions. Lack of acquired immunity combined with the particularly acute economic distress account for the spread inland from Trans- and Cis-Keian areas.

TABLE L (i).—TYPHUS FEVER IN THE UNION: CASES AND DEATHS REPORTED SINCE 1923, FOR YEARS ENDING 30TH JUNE.

Year.	Cases.	Deaths.
1923	7,099	755
1924	2,122	382
1925	1,144	163
1926	1,135	146
1927	895	136
1928	1,331	208
1929	1,480	193
1930	1,782	212
1931	1,541	261
1932	1,550	292
1933	2,125	302
1934	5,956	662
1935	6,826	998

The relative distribution among the four Provinces of the Union is shown in Table L (ii). It will be seen that during the past two years the Orange Free State suffered considerably more severely than the Cape. In that province there was relatively virgin soil for typhus infection combined with great economic distress.

TABLE L (ii).—REPORTED CASES OF TYPHUS IN THE PROVINCES OF THE UNION FOR YEARS ENDING 30TH JUNE.

Year.	Cape.	Natal.	O.F.S.	Transvaal.	Total.
1923	6,118	356	425	200	7,099
1924	1,392	241	286	203	2,122
1925	579	218	220	127	1,144
1926	701	87	272	75	1,135
1927	638	72	168	17	895
1928	1,154	91	68	18	1,331
1929	1,320	65	84	11	1,480
1930	1,564	57	149	12	1,785
1931	869	62	53	557	1,541
1932	1,263	51	40	196	1,550
1933	1,649	208	243	25	2,125
1934	1,905	207	3,636	208	5,956
1935	2,898	224	3,275	429	6,826

Local conditions of acute poverty account for occasional severe outbreaks in areas other than the Eastern Cape. Thus high incidence in the Transvaal in 1931 was due to outbreaks among natives living in squalid conditions on the various alluvial diamond diggings; the first outbreak occurred in the Ventersdorp District whence it spread to the Lichtenburg diggings.

Conditions among the European population of the Union rarely become so crude and impoverished as to allow of the rapid spread of typhus among them. The cases that occur among them must be looked upon as accidental overflows from adjoining reservoirs of infection in native territories. For this reason European communities of the Eastern Cape are liable to suffer severally if strenuous anti-vermin precautions are not taken. The relatively numerous cases which occur at, for example, Queenstown, are to be attributed to the badly infected poverty-stricken Glen Grey District. The notifications among Europeans for the past 11 years are shown in Table L (iii).

TABLE L (iii).—TYPHUS NOTIFICATIONS AMONG EUROPEANS IN THE UNION FOR YEARS ENDING 30TH JUNE.

Year.	Cape.	Natal.	O.F.S.	Transvaal.	Total.	
					Cases.	Deaths.
1923	39	3	8	6	56	6
1924	26	8	10	2	46	3
1925	13	19	2	3	37	0
1926	22	25	6	2	55	1
1927	13	21	4	1	39	2
1928	18	30	3	1	52	0
1929	27	17	1	0	45	0
1930	34	33	2	5	74	5
1931	26	21	3	3	53	2
1932	25	7	1	0	33	2
1933	43	9	1	1	54	3
1934	23	10	12	0	45	3
1935	38	16	29	14	97	5
TOTAL	347	219	82	38	686	32

The distribution of the 6,826 cases that were reported during the year under review is shown in Table L (iv).

TABLE L (iv).—TYPHUS FEVER: CASES AND DEATHS REPORTED DURING THE YEAR ENDED 30TH JUNE, 1935.

Province.	Number of Districts in which Outbreaks Occurred.	European.		Non-European.		Total.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Cape	62	38	3	2,860	328	2,898	331
Natal	16	16	—	208	59	224	59
Orange Free State	31	29	1	3,246	537	3,275	538
Transvaal	20	14	1	415	69	429	70
UNION	129	97	5	6,729	993	6,826	998

The mortality rate for the disease has been consistently low in the Union. Though looked upon by our legislation as a " formidable epidemic disease " this term is hardly warranted locally. Of the 686 European cases notified during the past eleven years only 32 were fatal, a case mortality of 4·7 per cent. Among our natives it would appear to be higher; of the 34,986 cases recorded in Table L (i), 4,665 were fatal, a case mortality of 13 per cent. But it must be remembered that deaths are much less imperfectly recorded among the Bantu of the territories than morbidity. It must be assumed therefore that these deaths occurred among a very much larger number of cases than those actually reported.

In spite of evidence that one form of typhus might occasionally be conveyed by the rat flea, the problem as it occurs locally is one of combating lice. The disease is most firmly entrenched in those districts where the population is poorest and lives under the crude conditions of which lice are virtually an unavoidable concomitant. Added to this is the fact that these people are very poorly nourished because of their inadequate maize-meal diet. These are the two most important factors for the persistence of typhus; the prevalence of lice owing to the low social scale of the population, and their low physiological resistance resulting from an inadequate, badly-balanced dietary.

Other subsidiary factors are also related to the backwardness and poverty of the Bantu population of the Eastern Cape. In spite of much propaganda work the bulk of the Bantu population are still ignorant of the cause of typhus, and have no abhorrence of lice. It is difficult to impress on them the danger of lousiness when members of a kraal are down with typhus.

Even if some notion of the desirability of cleanliness is impressed upon them, their customs often make reasonable cleanliness impracticable. According to tribal custom the native must take whatever piece of ground that is allotted to him. His allotment is generally far from water which has to be fetched in receptacles. Under these circumstances only the water absolutely necessary for drinking and cooking is conveyed to the huts. Washing of bodies, clothing or blankets is out of the question.

The witch-doctors have a very harmful effect. The Xosa is still very superstitious. When a severe sickness such as typhus attacks his family he consults the witch-doctor and readily believes that evil spirits have come among his family. He generally acts on the advice to leave the kraal with his stricken family. Verminous typhus patients and contacts scatter infection on their journey and at their destination lighted up the disease in other kraals. Some time usually elapses before the outbreak is brought to the notice of the authorities when proper action including the limitation of movement of infected persons can be taken.

The imitation of civilisation is also having harmful effects. The semi-civilised Xosa will adopt European clothing without the cleanliness which should accompany the wearing of such clothing. The increased possibility of lousiness is evident.

Typhus will disappear here as it has done elsewhere with advancing civilisation. Meanwhile this advance has been considerably retarded in the native territories by the rapid increase of the population and the consequent over-stocking of the country with cattle. This over-stocking is only relative. With improved methods of farming the country could carry a vastly greater population than at present. But with the primitive native farming methods the country is badly overpopulated and the increasing poverty necessarily results in increased susceptibility to and spread of disease. Government is assisting by providing instruction in modern agricultural methods. But progress is exceedingly slow, and the influence of such instruction only makes itself felt in the immediate vicinity of the agricultural colleges in the territories. The vast bulk of the Xosa and Pondo populations remain untouched. The women do the primitive farming, a mere scratching of the surface of the ground. This cannot long support the family. The young males then go to the mines for a contract period of nine months to earn the money to purchase from the stores the mealies necessary to support life in the kraal. At the mines they do not learn anything that is of any use to them for the farming of their allotments in the territories.

Combating lousiness among so huge a population of primitive, poverty-stricken Bantus is a formidable proposition. All the Union Health Department can do is to deal with typhus outbreaks wherever they are reported. Chiefs and headmen are required by law to report to the magistrates any outbreaks of disease among their people. When typhus is suspected the Union Health Department is notified and a typhus officer is sent to the area. He arranges for the deverminization of patients and contacts. Clothing and blankets are dealt with by means of hot air in the " tent deverminizer " or by steam in a " barrel deverminizer " designed by the Department. Patients and contacts are rubbed with " naphthalene oil ".

This consists of one part of naphthalene dissolved in eight parts of peanut or other vegetable oil. These measures are very effective and there is seldom any difficulty in stamping out an outbreak locally.

Active health propaganda is being carried on particularly in the native schools and must in time influence the population as a whole. But an abhorrence of lice is difficult to inculcate. Where the effects of inunction with naphthalene oil have been experienced a local demand for it is created. The physical comfort of a temporary freedom from lice is readily appreciated.

Education will in time counteract the influence of the witch-doctor, and cleanliness will come to be appreciated. Detribalisation (which results in the worst features of western civilization such as the wearing of European clothes on unclean bodies) is discouraged by the Government.

When the medical aids now being trained at Fort Hare are available in sufficient numbers, a powerful means of combating the disease will become available.

14. *Venereal Diseases.*—In European countries two of the conditions most frequently used as indices of the state of the public health are tuberculosis mortality and infantile mortality. Improvement of the health and living conditions of the people, results in a fall of both these death rates. They mirror the play of such factors as cleanliness, diet, housing, family income and community health effort. A choice of an index of social and health welfare in South Africa should certainly include and perhaps give the award to venereal disease. Venereal disease as an epidemiological influence in this country is unquestionably great if not supreme. When the population is considered as a whole—European and native combined—it is doubtful if any other group of diseases is the cause, directly and indirectly, of so much mortality and morbidity, so much economic loss, so much destruction of potential growth and increase of the population, so much mental pain and misery. They may be claimed to reflect the state of the social and health development of the peoples. The great social changes which have encompassed the native races under the European settlement of South Africa have led to the prevalence and distribution of syphilis, gonorrhoea and the other venereal diseases in their midst. Movements of native labour forces, the loosening of tribal control and code of morals, the relatively new phenomenon of native populations in urban areas of the European type with problems of occupation, recreation, housing, nutrition, clothing, education, civic and state relationship are factors inextricably interwoven with the question of venereal disease. The problem is also neither simple nor small in magnitude in the European. Again, there enter considerations of living conditions, personal hygiene, education and provision of medical facilities for treatment. As each of these associated problems in native or European is dealt with, when housing improves, when diets are adequate, when education in the broadest sense is disseminated, when occupation and employment of leisure time are developed, when health services are established and expanded, and when a higher civic and social sense has arisen, then will venereal disease, as with many other causes of morbidity and mortality, decrease. Venereal disease will be a gauge of communal pride and responsibility.

There is an awakening consciousness of the public to medical and health matters generally. Since the beginning of the century a change in attitude to venereal disease has been in progress, considerably accelerated by the war. In this more rational public opinion increasingly lies the hope of combating the problem. The prevention and limitation of a disease depends fundamentally upon the discovery of the causal agent and o fmeans of either destroying or obviating its operation in the human body. The causes of syphilis and gonorrhoea are known, treatment measures giving, under certain conditions, complete cure, are available, and yet these diseases are still not under control. In the following extract from Professor Greenwood's recent book—"*Epidemics and Crowd Diseases*"—will be found an interesting expression of the modern view of the situation:—

> "Recognition that venereal diseases were in an immense majority of instances contracted only through the sexual intercourse of susceptible with infected persons is nearly as old as the sixteenth-century epidemic. Not quite as old, because so good an observer as Fracastori could not wholly bring himself to believe that the great prevalence was not influenced by miasma. In our time the nature of the *materies morbi* has been completely elucidated.
>
> "It might perhaps have been expected that the control of a crowd-sickness, the essential nature of which was understood much earlier than that of any other human plague, would have been established long ago. No doubt it would have been had real human beings resembled the citizens of Plato's Republic. As they did not, the venereal diseases were as disastrously mismanaged as typhus, and

even now there is no very convincing evidence that they are much less of a menace to the communal health than they were at the beginning of the twentieth century. Failure to prevent typhus was—and still is—due to economic incompetence. Failure to prevent venereal diseases was—and still is—due partly to economic and partly to psychological incompetence.

" Hans Haustein's excellent history of the measures taken to deal with venereal diseases from the sixteenth to the nineteenth century is an instructive study in human incompetence, and well illustrates the disasters which always befall divided counsels. For reasons which I need not discuss, they are as valid, or—just as the reader pleases—as invalid, in the twentieth as in the sixteenth century, it was a crowd rule that sexual intercourse other than between husband and wife was a sin. Therefore, venereal disease was produced by a sinful action, the victim was a sinner. He or she, however, was also a sick person. Was the victim to be punished for the sin, cured of the sickness, or treated in both ways?

" From the beginning a distinction of sex was made; quite soon attempts by the State to punish the male sinner, which had always been a little half-hearted were generally abandoned. But legislatures were never quite sure in their attitude towards female sick sinners, whether the sin or the sickness was the important consideration. The inevitable result was that their administrative measures failed wholly from both the moral and physical points of view. Sexual sinfulness did not decrease; neither did the incidence of venereal diseases. In most countries the *treatment* of the venereally sick has been pretty completely freed from an associated moral condemnation *on the part of the administrators.* It has not been freed from moral condemnation on the part of an important minority—possibly a majority—of the general public.

" The prophylaxis of venereal diseases is still in most civilized countries not freed from moral stigma, either administratively or in public opinion. . . . .

" There is, I think, this ground for optimism. That on the whole the crowd attitude, as expressed in its administrative rules and its social reactions, is a little saner than before the war. But this generation will have passed away, and many billions of words will have been spoken before the most eminently preventable of all crowd-sicknesses are actually prevented."

In South Africa the subject is continually being discussed in both official and lay circles. Annually representations are made by various organizations to the Government, indicating a live and urgent interest. The Department of Public Health has always been seriously concerned, and has had in operation a scheme of free diagnosis, free distributions of drugs, assistance to local authorities in the establishment and operation of venereal diseases clinics and institutions, support to voluntary and official organizations in propaganda and educational campaigns, and finally sections of the Public Health Act controlling " quack " treatment. However, with a view to co-ordinating the various activities, extending their influence, and generally conducting a more direct and energetic campaign, an Assistant Health Officer, Dr. Gear, has been appointed to make a study of the epidemiological features of venereal disease in South Africa. Dr. Gear assumed duty on the 29th May and has already seen something of both Government and municipal activities in this field on the Reef.

Campaigns, be they military, commercial or health, cannot be conducted successfully in the absence of reliable information of the forces of the enemy, the state of the market, or the extent of the disease, respectively. In all health programmes an essential fundamental preliminary is the determination and definition of the problem to be tackled. Without reliable information, mistaken policies and pleas will be advocated, and much energy, time and money spent uselessly. England largely owes its happy state of being a model to the world in successful public health administration to the vital and medical statistical service initiated by William Farr. Farr showed the relationship of high mortality to such factors as overcrowding, infected water supplies, harmful occupation, and this provided Simon with the necessary arguments for securing the establishment of public health in England.

In the case of venereal disease the determination of the size of the problem is rendered especially difficult by its social implications leading to secrecy and concealment. Disease notifications and death certificates are but a poor index of the actual roles syphilis and gonorrhoea play. Wild statements emanating from numerous sources, of the alleged incidence of syphilis and gonorrhoea have been made in South Africa. To arrive at the truth is difficult. Fuller vital and medical statistical information is an urgent necessity in venereal disease as in other conditions in South Africa.

The first essential in the campaign seems to be the collection, the correlation, and even the development of machinery, for the collection of information regarding the incidence of venereal diseases in South Africa. Especially is this demanded for the native population. The haphazard evidence at present available does undoubtedly indicate a serious situation, but it is vague and probably misleading in respect of many important factors. Not only is statistical information required; there is an urgent need for research into the pathological picture of syphillis and gonorrhoea in the native races, the poor white, and generally in this country. It is believed that venereal diseases are of recent introduction into the native races. New diseases on virgin soil produce usually a different and more dramatic effect than in populations where it has long reigned. The appalling destruction wrought by syphilis in Europe in the sixteenth century is ascribed to its operation in, and spread through, a population previously uncontaminated. What is syphilis doing in the native? What are its immediate and remote effects on him? Is it leading, or likely to lead, to a rise in mortality from cardiac, renal, arterial and neurological causes? Is it producing or likely to produce an effect on the native birth-rate, infantile mortality rate, the incidence of nervous diseases? Is gonorrhoea going to produce much blindness and female generative disability? These and numerous other problems of pathology and treatment require urgent study in South Africa. Clinics, hospitals and other institutions treating venereal disease have much valuable material for investigation, which should not be allowed to go to waste. It is hoped that a programme of research will be launched—herein lies a useful field for exploitation by the medical schools—the results of which will be valuable in guiding correctly the public health policy.

Every person realises that one of the strongest weapons in the preventive medical armamentarium is education. This has been stressed again and again in South Africa, and much progress has been made by municipalities, by voluntary organizations and by Government Departments in educating the public in this and allied subjects by the use of pamphlets, films, posters, lectures, and the inclusion of instruction in the syllabuses of normal college students. The elaboration and widening of this propagandist and educative policy will have to be considered. Public opinion must be hastened towards the ideal of considering venereal diseases on the same basis as other communicable diseases, diagnosis and treatment being conducted in clinics and hospitals not specifically limited to venereal disease. The medical attitude to them must be the same as to similar epidemiological conditions; venereal disease, therefore, should be treated under similar conditions. There is no need for separate institutions—the visiting of which carries a stigma in the mind of the patient.

A venereal disease scheme in South Africa has not to be approached as one isolated from the general public health programme. Difficulties owing to division of responsibilities of health between provincial and Union authorities exist, but veneral disease must fit into the general public health organizations. The district surgeon system is a great network covering South Africa which, amongst other matters, provides information about, and treats, venereal disease. A preliminary attack has been made on the problem of providing a medical service in the native areas, by the training of native medical aids. A maternity and child welfare section of the Department has been established, and the furtherance of schemes of district nurses is under consideration. Industrial health services, such as exist on the gold, coal and diamond mines, missionary hospitals and clinics, the health services of local authorities, the railways, the ports and the activities of voluntary health associations, are amongst the major forces tackling health problems in the Union.

These social and health developments, both for native and European, are of intimate concern in the formulation of a venereal disease scheme which will receive careful examination and consideration in the near future.

The leaders of Bantu opinion are becoming alarmed at the prevalence of venereal diseases in native areas. At the meeting of the United Transkeian Territories General Council in April, the matter was discussed in detail by native councillors. One councillor stated that these diseases were now as hated as leprosy by his people; many people did not know that infection occurred simply by two people coming together; their own native herbalists could not cure the disease; though they knew that the law required them to go to doctors for treatment they did not go because they did not believe in the efficiency of the doctor's treatment. He suggested that the headmen should take sufferers to the doctor. Another councillor pointed out that the law regarding venereal diseases was not observed since it was left to the patient to report himself to a doctor; the difficulty was that persons affected hid the fact and before their condition was detected they had infected many others. Eventually, after a very full and well-informed discussion, the conference adopted the following resolution:—

> "That, while it is realised that legal machinery exists for the compulsory treatment of persons suffering from veneral disease, the fact remains that the law is largely inoperative and this conference is of opinion that means should be sought to secure the treatment of sufferers. That experience in other parts of the world may suggest to the Public Health Department how the position can be met, but that in the meantime magistrates should endeavour by intensive propaganda to bring home to the natives the urgent need for taking advantage of the provisions for free treatment."

The accompanying table summarises the work done during the year in connection with venereal diseases by district surgeons, local authorities and institutions. From this table it will be seen that district surgeons attended 1,870 European patients and 53,381 non-European patients during the year as compared with 1,964 and 33,506, respectively, in the preceding year. Again the attendances at local authority clinics were 38,679 in respect of Europeans and 88,756 in respect of non-Europeans as compared with 41,775 in respect of Europeans and 79,472 in respect of non-Europeans during the preceding year.

TABLE M.—VENEREAL DISEASES: CASES TREATED AND ATTENDANCES, YEAR ENDED 30TH JUNE, 1935.

Locality.	In Hospital.						Outdoor.					
	Syphilis.		Gonorrhoea and Other Venereal Diseases.		Total.		Syphilis.		Gonorrhoea and Other Venereal Diseases.		Total.	
	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.	European.	Non-European.
(1) *By District Surgeons.*												
Cape	28	1,037	11	220	39	1,257	355	15,807	258	959	613	16,766
Natal	8	378	8	234	16	612	57	4,625	45	384	102	5,009
Transvaal	2	1,669	10	75	12	1,744	363	24,772	238	529	601	25,301
Orange Free State	—	4	2	—	2	4	351	5,821	203	484	554	6,305
TOTAL	38	3,088	31	529	69	3,617	1,126	51,025	744	2,356	1,870*	53,381*
(2) *At Institutions and Clinics.*												
Aliwal North	—	—	—	—	—	—	—	262	1	3	1	265
Barberton	—	236	—	—	—	236	—	—	—	—	—	—
Bethlehem	—	29	—	16	—	45	—	—	—	—	—	—
Bloemfontein	9	119	10	23	19	142	286	1,479	297	75	583	1,554
Bochem	—	910	—	17	—	927	—	2,519	—	337	—	2,856
Boksburg	5	26	—	—	5	26	—	267	—	—	—	267
Capetown	34	216	58	39	92	255	6,775	14,584	6,122	3,242	12,897	17,826
Durban	25	661	64	116	89	777	501	1,410	5,383	2,424	5,884	3,834
East London	—	—	—	—	—	—	47	1,584	394	397	441	1,981
Elim	2	552	1	13	3	565	—	163	1	—	1	163
Johannesburg	—	—	—	—	—	—	5,567	—	4,745	—	10,312	—
Kimberley	1	121	1	—	2	121	231	2,300	151	202	382	2,502
Kingwilliamstown	—	109	3	6	3	115	—	23	—	1	—	24
Kroonstad	—	—	—	—	—	—	—	3,639	—	—	—	3,639
Krugersdorp	2	37	4	1	6	38	29	13	80	12	109	25
Kuruman	—	29	—	—	—	29	—	180	—	—	—	180
Marianhill	—	—	—	—	—	—	—	238	—	34	—	272
Molteno	—	—	—	—	—	—	8	87	—	—	8	87
Mphalele, Pietersburg District	—	106	—	—	—	106	—	1,443	—	—	—	1,443
Olifantshoek	—	—	—	—	—	—	7	427	21	—	28	427
Oudtshoorn	—	—	—	—	—	—	—	306	—	—	—	306
Pietermaritzburg	—	126	—	101	—	227	232	9,822	181	6,035	413	15,857
Port Elizabeth	1	—	—	—	1	—	1,971	8,475	1,582	1,248	3,553	9,723
Port St. Johns	—	—	—	—	—	—	—	118	—	4	—	122
Potchefstroom	—	—	—	—	—	—	5	2,186	—	—	5	2186
Pretoria	—	—	—	—	—	—	1,560	10,090	1,864	2,416	3,424	12,506
Rietfontein	106	3,271	259	914	365	4,185	256	3,667	—	—	256	3,667
Sekukuniland (Jane Furse Memorial)	—	85	—	—	—	85	—	2,697	—	29	—	2,726
Somerset West	—	—	—	—	—	—	34	192	7	—	41	192
Springs	—	—	—	—	—	—	—	771	—	—	—	771
Standerton	—	13	—	—	—	13	—	—	—	—	—	—
Stellenbosch	—	10	—	—	—	10	—	518	—	—	—	518
Strand	—	—	—	—	—	—	∫	111	—	—	—	111
Swellendam	—	14	—	1	—	15	—	—	—	—	—	—
Uitenhage	—	29	—	2	—	31	319	2,389	22	41	341	2,430
Vryburg	—	120	—	1	—	121	—	296	—	—	—	296
TOTAL	185	6,819	400	1,250	585	8,069	17,828	72,256	20,851	16,500	38,679†	88,756†

* Patients only. † Attendances only.

Investigations in the biological control laboratories revealed the presence of a venereal disease hitherto unrecognised in South Africa, namely, *Lymphogranuloma inguinale*. A description of one such case was published in the South African Medical Journal of 10th August, 1935.

VI.—GENERAL.

1. *Housing and Slum Elimination.*—Full details of the working of the Housing Act, No. 35 of 1920, from the date of its commencement, are given in the report of the Central Housing Board for the calendar year 1934 (U.G. No. 21, 1935) which was laid on the Tables of Parliament. A summary of the position as at 30th June, 1935, is given in the following table:—

Table N.—Housing Act No. 35 of 1920: Working from Promulgation (16th August, 1920) to 30th June, 1935.

Province.	Loan Applications Approved.			Loan Issues.	Number of Houses					
	European.	Non-European.	Total.		Completed.	Under construction.	Approved, but not yet commenced.	Total.	Total for European occupation.	Total for non-European occupation.
(A) *Economic Housing.*	£	£	£	£						
Cape	1,308,824	651,413	1,960,237	1,888,354	6,828	27	182	7,037	2,137 (*a*)	4,900 (*b*)
Natal	545,930	87,470	633,400	623,805	1,007	3	6	1,016	533	483 (*c*)
Orange Free State	493,458	17,618	511,076	508,661	1,410	323	1	1,734	590 (*d*)	1,144 (*e*)
Transvaal	1,006,349	238,220	1,244,569	1,205,629	3,537	35	60	3,632	1,342	2,290 (*f*)
Total	3,354,561	994,721	4,349,282	4,226,449 (*g*)	12,782	388	249	13,419	4,602	8,817
(B) *Sub-Economic Housing.*										
Cape	106,168	263,937	370,105	240,405	1,035	121	144	1,300	465	835
Transvaal	117,497	—	117,497	9,997	25	—	235	260	260	—
Total	223,665	263,937	487,602	250,402	1,060	121	379	1,560	725	835
Total (A) and (B)	3,578,226	1,258,658	4,836,884	4,476,851	13,842	509	629	14,979	5,327	9,652

(*a*) Includes a hostel to accommodate 86 persons.
(*b*) Includes 1,337 single rooms in blocks, 8 barracks and 160 flats.
(*c*) Includes 3 barracks and 36 single rooms in blocks.
(*d*) Includes a hostel for European girl employees at Bloemfontein.
(*e*) Includes 24 single rooms in blocks, the balance of 845 representing the approximate number of dwellings to be built out of a total loan of £16,818 made to three Local Authorities for use exclusively in purchasing materials to be advanced to Coloured persons and Natives building their own homes.
(*f*) Includes 303 single rooms in blocks, 3 compounds and 13 hostels.
(*g*) Includes £1,065,480 re-issued out of repaid capital.

Although the period under review did not reflect any appreciable speeding up of actual building operations under the Housing Act, the last quarter of the year was noteworthy for a considerable increase in the number of loan applications which came forward from local authorities for financing further housing undertakings, and among the latter, some of which are still under examination, are to be mentioned applications totalling close on £250,000 received from the Johannesburg Municipality, an application of £50,000 from the Pretoria Municipality, and applications for less amounts from several other smaller local authorities. It is known also that the Capetown Municipality has certain further large schemes in contemplation, details of which are at present being worked out. The majority of these fresh schemes have been formulated as a result of the housing surveys undertaken in the areas of the larger local authorities and are primarily intended to provide accommodation for persons displaced from overcrowded and insanitary dwellings as an outcome of action taken under the Slums Act.

There were no drawings on the £100,000 provided on the loan estimates for econmic housing during the financial year 1934-35 for the reason that re-issues from repaid capital in the hands of Provincial Administrations proved sufficient for meeting the requisitions, totalling £112,986, which were submitted during that year by local authorities for payment of work done and services rendered on approved schemes and dwellings. For the three months ended 30th June, 1935, the requisitions for payment received from local authorities in respect of economic housing totalled £34,214 which again it was possible for Provincial Administrations to meet out of repaid capital in their hands, so that at the end of the first quarter of the financial year 1935-36 the £150,000 provision for granting economic loans during that year had not been drawn upon. In respect of sub-economic housing, advances to local authorities during the financial year 1934-35 absorbed £48,491 out of that year's £500,000 provision, while at the end of the first quarter of 1935-36, the provision of £250,000 for that year in respect of this class of loan had been drawn upon to the extent of £9,595. There is every reason, however, to anticipate as a result of the fresh schemes that are now coming forward to which reference is made in the preceding paragraph, that the drawings on loan funds during the second half of the current financial year will be much heavier.

The enforcement of the Slums Act is proceeding steadily and, apart from its application to the eight centres included in the First Schedule thereto (viz. Bloemfontein, Capetown, Durban, East London, Johannesburg, Pietermaritzburg, Port Elizabeth and Pretoria), an extension of its provisions has been effected by Proclamations under section 1 (3) to King-williamstown, Randfontein and George. Applications have also been received and are at present under consideration for the extension of the Act to Mossel Bay, Beaufort West, Grahamstown, Germiston, Graaff-Reinet and Roodepoort-Maraisburg.

Information to hand of activities under the Slums Act shows that at Capetown during the past twelve months five areas have been dealt with and that the Medical Officer of Health has presented 200 reports of premises where nuisances existed, 157 of which were declared slums and in the remaining 43 the nuisance had been abated. At Johannesburg the areas known as Bertrams, New Doornfontein and Prospect Township, have been dealt with and some 207 stands have been declared slums. The Bloemfontein Town Council resolved in October, 1934, that before applying the procedure of the Slums Act, owners be given notice that unless alterations were made within thirty days or demolition undertaken within three months of service of notice, the premises would be dealt with in terms of the Slums Act, and as a result of action under that resolution 112 notices have been served to date resulting in the demolition of 26 dwellings. The George Municipality is taking steps to declare as slums certain properties in the town and notices have been served requiring the owners to demolish approximately 90 huts while the demolition of 50 huts on municipal ground at Barriesdale is in hand and should be completed by the end of September. At Port Elizabeth the notorious Rainbow Terrace properties consisting of 72 buildings occupied by 61 coloured and 19 native families (a total of 160 adults and 150 children) were declared slums and demolished. At other centres a survey of premises is being undertaken and dealt with in the order of the survey.

In the case of properties which have been declared slums by the local authority, the owners thereof have, in terms of section 4 (10) of the Act, the right of appeal to the Minister, whose decision is final. The number of such appeals dealt with to date total 68 (19 from Capetown, 45 from Johannesburg and 4 from East London), and in every instance the declaration of the local authority was upheld. One of the main grounds advanced in support of a number of these appeals was that the local authority was wrong in finding that the nuisance could be most effectively dealt with under the Slums Act as required by section 4 (8), and that the nuisance could be dealt with as effectively under the powers provided in the Public Health Act or

under certain provincial ordinances. In this connection it is to be remembered that the intention of the Slums Act is to provide more simple machinery for dealing with insanitary and overcrowded premises than in the Public Health Act, and obviously for purposes of slum clearance, the Slums Act is the only machinery, while in other cases it would appear to be entirely in the discretion of the local authority to use the quicker machinery of that Act if it deems it more effective to do so.

In connection with investigations by the local authority of conditions existing on premises which have been adversely reported on by the Medical Officer of Health as constituting nuisances within the meaning of section 1 (2) of the Slums Act, the records of the proceedings of hearings held in terms of section 4 (7) (*b*) by the responsible committee of the Johannesburg Municipality reflect that it was nothing exceptional for single rooms to be let to native families at monthly rentals ranging from £1. 5s. to £2. 10s., and the instance is quoted of a property costing £2,500 which yielded in rents from natives a monthly nett return of £40. Further examples recorded of lucrative returns on money invested in this class of property include that of one costing £3,500 from which rentals totalling £693 were collected during the year, while in another instance rentals totalling £150 per month were collected in respect of a shop and 178 rooms let to natives in which were housed 348 adults and 132 children. The evidence at these hearings also disclosed that, in the case of certain two-roomed dwellings which had been passed by the Council on the understanding that they would be let to one family, the practice had been resorted to of closing up the intervening door and fanlight so as two provide two single room lettings to accommodate two families, by which action not only were the dwellings converted into illegal back-to-back structures but conditions of gross overcrowding were brought about.

Subject to the approval of the Minister in writing, a local authority is empowered by section 17 of the Slums Act to acquire by agreement or expropriation any land comprised in a slum and any land adjoining thereto if in the latter case the local authority is of opinion that the acquisition thereof is necessary or useful for forming an area of convenient shape and dimensions. Applications were submitted by the Capetown Municipality for the acquisition of land in four different areas of the city to be utilized for carrying out housing schemes and in two of these the required sanction was given after the sites had been inspected and reported upon as suitable for the purpose in view; the remaining two applications are still under consideration. An application from the Johannesburg Municipality is also under investigation for the acquisition of land in the Bertrams area in connection with a contemplated housing scheme of the Council. At all the large centres panels have been approved from which the appointment of a sole arbitrator will be made as required in terms of section 19 (2) and at fees which have been fixed in terms of section 22.

Under powers delegated by the Minister, it was arranged for a survey of Government-owned property to be undertaken by the medical officer of health to the municipality at each of the centres included in the First Schedule to the Slums Act, with the exception of Durban, where the work is being done under the supervision of the Department's Senior Assistant Health Officer stationed there. The reports on these surveys which have so far been submitted, reveal serious conditions in the case of a number of properties and while the Railway Administration is perhaps the worst offender, several other Government Departments are also affected. It is clear that neither the Public Works Department nor the Railway Administration has made sufficient financial provision for this financial year to deal even with urgent nuisances under the Act, and it would seem that a very large sum will have to be provided next year for putting these properties in order.

2. *Housing of Industrial Natives in Natal.*—This is governed in Natal by regulations Nos. 17 to 28 promulgated under Government Notice No. 659 of 16th June, 1915.

The regulations themselves may have to be repromulgated in a slightly amended form under the Public Health (Amendment) Act, 1935, to make them applicable to housing which is not strictly industrial, but on the whole they have worked well when applied. As will be shown later, there is a marked movement on the part of Indian shanty keepers and others living in the neighbourhood of estates and small local authorities to erect hovels for the housing of labour employed at these places and such housing cannot be dealt with under the existing regulations. These collections of shanties give endless trouble to estate owners who would like to see drastic measures taken in regard to them, but the same cannot be said of certain local authorities.

Following the Great War, considerable headway was made by using inspectors of labour apointed by the Native Affairs Department to supervise

this housing under the Assistant Health Officer. Subsequent to 1925, however, these officers were employed on other duties and could no longer supervise housing, and, the Health Department having no staff other than the single Assistant Health Officer, pressure could not be kept up.

Housing progress on sugar estates and wattle plantations is largely a matter of economics. Both industries had considerable periods of depression prior to the onset of malaria in 1929, which made progress impossible until it was got under in the 1933-34 season, when times began to improve all round and estate owners could be expected to begin to improve premises.

The malaria staff of the Department was slowly got together and began to be adequate for general control in the 1933-34 season when its energies were wholly taken up by malaria.

Advantage was taken, however, of an extra health officer and inspectors in 1931 to make a rough survey of all the estates, some 600 in number.

In 1934 some of the larger estates, ignoring the regulations, embarked on building schemes to their own idea hoping that no action would be taken against buildings actually in being.

For years many estates have tried to get sanction to erect dwellings without windows on the plea that nothing except shutters would remain unbroken. Such could not possibly be sanctioned, but until the Department had staff, it was easy to evade the regulation requiring owners to submit plans and leave the Department's officers to find out evasions for themselves. The matter became further complicated by the adoption of insecticidal control of malaria. A type plan, always previously recommended by the Department and pressed upon the Sugar Association, which provided for very free ventilation over the windows and along the whole length of the eaves, was found to provide a barrack which it was stated was difficult to spray effectively, and this was made an excuse for the evasion of the ventilation and lighting provisions provided by the regulations.

There is a very considerable amount of leeway to be made up in the construction of new barracks, demolition of premises incapable of satisfactory repair and renovation of buildings to bring them up to standard, and it is considered a prime essential that new barracks should conform to standard and that occupation should not be allowed until they do.

The occupation of shuttered dens without windows or ventilation, even although they meet the other requirements of the regulations and are quite new, cannot be permitted, all apart from the fact that the owners have deliberately designed an evasion of the regulations when they built them and have even asked departmental officers to pass their structures on the grounds that the defective barracks are easier to disinfest against mosquitoes than those built in accordance with the regulations.

The question of the recruitment of labour which may be housed in such structures is engaging the attention of the Native Affairs Department.

These undesirable structures have been erected not only in magisterial areas, but also in those of certain local authorities. Certain employers have carried out alterations at the request of the Department, but others have so far refused and it is likely that considerable pressure will have to be exercised to make these owners comply with the law.

During the last two months of the year under review, reports on the inspections of 125 estates and properties were received from the Department's field staff and it was shown that a very large amount of the non-European housing on the sugar and wattle belts contravened the regulations, particularly in respect of light and ventilation, and sanitation in many instances is crude or absent. On the other hand, there are employers, large and small, whose premises are models, but they constitute a small minority.

As a result of these inspections and discussions *in loco*, plans are coming in for approval and if the movement for better housing is not interrupted by epidemic conditions considerable improvement is in sight, particularly on the larger estates.

The following anomalies make for difficulty on the sugar belt and are not sufficiently covered by regulation:—

(*a*) Certain farmers permit natives to build huts on land provided they pay a rent of £3 per annum. These natives are employed on farms and elsewhere.

(*b*) Farmers are permitting native labourers to build their own huts to accommodate their own families. There does not appear to be much occupation of such premises by unattached natives. Nyasas are particularly prone to this sort of occupation.

(*c*) In many cases, farmers permit employees to vacate barracks and erect grass huts; but this is mainly limited to quarters which do not conform to the regulation, such as iron barracks. In other cases, it is the result of overcrowding.

(*d*) There are instances of Indians erecting houses and letting them as lodgings or letting enclosed verandahs of stores for the accommodation of sugar estate employees and other persons.

The need for extended regulations to cover these cases is apparent.

3. *Peri-Urban Slums and Villages without any Local Government in Natal.*—This is the most important public health question in Natal at present and deserves the earnest consideration of the Provincial Administration and the Government. Otherwise there is a danger that the campaign against tuberculosis may be jeopardised.

The formation of " black belts " on the borders of existing townships has been steadily progressing for years. Repeated warnings have been given by the Department, but up to the present no adequate steps have been taken to stop the process.

In fact the authorities in charge of certain townships seem to regard such slum formation with a certain amount of satisfaction as relieving them of undesirable elements of their population and, as they put it, placing responsibility for the proper control of these slums upon the Union Government (in the person of the magistrate). The Administration, when asked to force local control upon such areas, has explained that unless the request to assume such responsibility and its attendant expenses, comes from the area itself, it is powerless to do anything. Needless to say, no headway can be made under such circumstances.

The local authorities menaced are not helpful. If they can, they pass responsibility for these slum classes over to a magisterial area by chasing the sub-economic class over their boundary to make a new slum. Their interest then limits itself to a claim that it is now up to the Union Government to provide proper control for the people driven out. These people depend for their livelihood on the urban area which has done nothing for them.

An outstanding example is Pietermaritzburg which has a notorious " black belt " on its border for which it will do nothing. The future of this belt has actually been considered by a Commission appointed by the Administration. When the Commission failed to reach a practicable solution, the Administration commenced to consider the possibility of the formation of a local authority for the area. Such could only effectively function with a staff which the Department showed would be most economically provided by Maritzburg, a suggestion which failed to find favour with the Administration. The Native Affairs Department is unable to deal with the area under the Native (Urban Areas) Acts as the population is mixed and not confined to natives. The problem is still unsettled, but the malaria menace caused the Minister, as a temporary measure, to authorise the magistrate to contract with the local authority, at the expense of the provincial revenue fund, to carry out all necessary anti-malaria measures in the area.

At Estcourt the position is even worse. Here there is a slum area surrounded by the borough and apparently no way of forcing incorporation. The inhabitants have the advantage of urban amenities and pay no rates; yet incorporation cannot be effected unless they ask for it! The Administration is unable to take the lead. The corporation would like to do so, but will not take any steps itself.

Immediately outside Estcourt there is an area rapidly filling up with slum houses. The local authority, when there was no settlement at this place, was warned years ago to extend its borders to include it. Nothing was done. Now it is a first-class slum problem.

At Stanger again the position is bad. Only a few months ago the Department put pressure on the local board to clean up its unsavoury slums. The advice was taken. Land outside the township was acquired by certain individuals and the slum population settled there on squatters' rents as it was evacuated. In three months 39 shanties were built to house this population. The magistrate is held to be responsible. In fact persons congratulated themselves that they had successfully off-loaded this problem on to the Union Government.

At other places, conditions cry aloud for local government. A notable instance is Kranskop, where there are township funds; the community uses a Provincial water supply and pays 4s. per 1,000 gallons; the place is self-contained; there has been a succession of magistrates who have actually provided public amenities, such as a park, and there is every chance of cultivating a civic spirit. It would be difficult to make out a more favourable case for local government. Without the institution of a proper system of local government control in an area, any real advantage in public health must necessarily be a matter of grave difficulty, and it is to be earnestly hoped that the Natal Provincial Council will empower the Executive Committee to take steps—as has been done in the other Provinces—to extend the boundaries of local authorities or to establish local government control in

any area where such has been shown in the interests of public health to be necessary without awaiting for a request to come from the area itself.

Durban, whose boundaries were extended some three years ago, is itself still in some difficulties over its former black belt now included in the borough. Its boundaries were extended to march with the boundaries of other local authorities or native reserves, or are at such a distance from the industrial area of the town that it is not economical for the poorer classes of the population to get outside to form a slum. This obtains in regard to natives. In fact, the corporation puts its native village on its boundary and finds that difficulties arise on account of transport costs. It was hoped that once the corporation took over its former black belt that it would manage to reorganize it. A start has certainly been made with some Indian shanty owners, but the fact remains that the slum growth in some of the outlying areas is, if anything, on the increase. These areas will have to be energetically tackled under the Slums Act if the matter is to be put right.

4. *Slaughtering and Meat Inspection.*—The degree of infestation of our slaughter animals with measles and the risk of tape worm infestation to human beings has become a matter of serious national importance. Inquiry was made at the abattoirs of the larger towns to ascertain with some accuracy the percentage of the cattle slaughtered that were found infested. For a period of twelve months the following figures were found:—

	No. of Cattle found infected.	*Percentage.*
Port Elizabeth	905	11·8
Kingwilliamstown	154	9·2
East London	349	5·1
Durban	1,492	4·5
Pietermaritzburg	329	3·8
Pretoria	416	2·0
Grahamstown	53	1·8
Germiston	228	1·3
Krugersdorp	—	1·2
Capetown	421	1·0
Johannesburg	643	0·6

The prevalence of measles in cattle slaughtered depends on the region from which most of the animals are drawn. Human tapeworm infestation is very prevalent in the native areas of the Cape. Owing to the insanitary habits of the population, pastures become infected with tapeworm eggs, and cattle grazing on such pastures ingest the eggs which develop in them into the form of the worm which invades the muscles and is known as measles. Measles in pigs has a similar history. Their infection may be even more direct since pigs are notorious scavengers and may directly consume infested human excrement.

While a careful watch is kept by trained meat inspectors at the abattoirs of our larger towns to prevent measly meat reaching the public, the danger can never be entirely obviated with so large a percentage of infested animals. Fortunately the flesh is usually well cooked in this country before consumption. Thorough cooking will destroy all the worms.

The only really effective measure for dealing with this problem is improvement of sanitation in rural areas. Since so large a percentage of the native population harbour the adult worms in their intestines infestation of pastures must necessarily occur with their present habits. Extensive construction of latrines and education in the necessity for using them on farms where our meat is raised is essential for preventing the continued infestation of this important food supply.

It is to be doubted whether the farming community will really take the matter in hand as long as compensation funds are maintained in connection with the abattoirs. It probably would be in the interests of public health in the long run if these compensation funds were to be abolished.

5. *Child and Maternal Welfare.*—In Table O (i) are shown the figures for deaths of infants under one year per 1,000 births. As will be seen, the rate for 1934, viz. 60·79, is lower than that for 1933, which was 61·01. Both are very much lower than those for the previous ten years. The improvement is an indication of the response to the work which has been carried out by child welfare clinics, health visitors and district nurses.

TABLE O (i).—EUROPEAN INFANTS: BIRTHS AND DEATHS UNDER ONE YEAR REGISTERED AND INFANTILE MORTALITY RATE, I.E. DEATH RATE PER 1,000 BIRTHS, 1919-1934.

Year.	Cape.			Natal.			Transvaal.			Orange Free State.			Union.		
	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.	Total European Births Registered.	Deaths of European Children under One Year.	Death-rate per 1,000 Births.
1919.....	16,749	1,351	80·66	2,910	191	65·64	15,338	1,326	86·45	4,727	382	80·81	39,724	3,250	81·81
1920.....	18,425	1,654	89·77	3,256	235	72·17	16,768	1,576	93·99	4,996	448	89·67	43,445	3,913	90·07
1921.....	18,062	1,382	76·51	3,370	203	60·24	16,582	1,374	82·86	5,288	379	71·67	43,302	3,338	77·09
1922.....	18,248	1,294	70·91	3,294	180	54·64	16·370	1,292	78·92	4,920	357	72·56	42,832	3,123	72·91
1923.....	18,296	1,353	73·95	3,229	197	61·01	15,619	1,261	80·74	5,037	328	65·12	42,181	3,139	74·42
1924.....	18,730	1,296	69·19	3,410	273	80·06	15,287	1,171	76·60	4,919	382	77·66	42,346	3,122	73·73
1925.....	18,366	1,343	73·12	3,509	206	58·71	16,348	1,059	64·78	5,188	361	69·58	43,411	2,969	68·39
1926.....	18,675	1,196	64·04	3,588	189	52·68	16,304	1,186	72·74	5,309	273	51·42	43,876	2,844	64·82
1927.....	18,537	1,293	69·75	3,435	166	48·32	17,050	1,359	79·71	5,325	314	58·97	44,347	3,132	70·63
1928.....	18,032	1,240	68·77	3,514	184	52·36	17,949	1,370	76·33	5,318	365	68·63	44,813	3,159	70·49
1929.....	19,008	1,169	61·50	3,650	177	48·49	18,227	1,342	73·63	5,334	280	52·49	46,219	2,968	64·22
1930.....	19,468	1,332	68·37	3,641	159	43·65	19,108	1,386	72·54	5,317	300	56·42	47,534	3,177	66·84
193	19,180	1,182	61·63	3,538	162	45·79	18,733	1,267	67·65	4,975	317	63·72	46,423	2,928	63·07
1932.....	18,284	1,205	65·90	3,373	204	60·48	18,376	1,402	76·30	4,911	271	55·18	44,944	3,082	68·57
1933.....	17,931	995	54·49	3,441	166	48·24	18,452	1,266	68·61	4,695	299	63·68	44,519	2,716	61·01
1934.....	17,642	1,022	57·93	3,310	157	47·43	19,327	1,279	66·18	4,599	270	58·71	44,878	2,728	60·79

Maternal mortality rates are shown in table O (ii). These deaths, which are almost entirely preventable by skilled medical and nursing assistance, continue to be distressingly numerous. The maternal mortality among Europeans was higher in 1934 than it has been for very many years past. It emphasises the urgent necessity for better maternity nursing services, particularly in rural areas. The causes of death are analysed in table O (iii).

TABLE O (ii).—MATERNAL MORTALITY: EUROPEANS.

Year.	Live Births Registered.	Deaths due to Puerperal Causes.				
		Number.		Rates per 1,000 Live Births.		
		Puerperal Sepsis.	Other Puerperal Causes.	Puerperal Sepsis.	Other Puerperal Causes.	Total Puerperal Mortality.
1926.....	43,876	88	112	2·06	2·50	4·56
1927.....	44,347	101	112	2·28	2·53	4·81
1928.....	44,809	102	121	2·28	2·70	4·98
1929.....	46,219	140	103	3·03	2·23	5·25
1930.....	47,536	119	131	2·50	2·76	5·26
1931.....	46,423	116	102	2·50	2·20	4·70
1932.....	44,944	126	113	2·80	2·51	5·31
1933.....	44,519	113	101	2·54	2·27	4·81
1934.....	44,878	121	148	2·69	3·30	5·99

TABLE O (iii).

Causes.	European Deaths from Puerperal Causes—1933. (According to Age Periods.)								European Deaths from Puerpetal Causes—1934. (According to Age Periods.)							
	All Ages.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45 and Over.	All Ages.	15–19.	20–24.	25–29.	30–34.	35–39.	40–44.	45 and Over.
Post Abortive Sepsis	32	1	7	13	6	2	2	1	30	1	3	10	9	5	1	1
Abortion—not returned as Septic	7	1	—	1	1	3	1	—	5	—	1	—	1	1	1	1
Ectopic Gestation	11	—	2	3	4	2	—	—	13	—	1	6	1	3	2	—
Other Accidents of Pregnancy	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Puerperal Haemorrhage	34	2	4	6	5	9	6	2	40	—	8	11	10	5	6	—
Puerperal Sepsis	81	9	14	23	8	16	10	1	91	5	24	19	23	9	9	2
Puerperal Albuminuria and Convulsions	15	1	3	3	5	2	1	—	39	2	7	7	8	10	4	1
Other Toxaemias of Pregnancy	1	—	—	—	1	—	—	—	7	—	1	2	2	2	—	—
Puerperal Phlegmasia—Alba Dolens, Embolism and Sudden Death	3	—	1	—	1	1	—	—	9	—	—	1	1	6	1	—
Other Accidents of Childbirth	24	—	4	4	6	7	3	—	34	1	9	10	6	3	5	—
Other or Unspecified conditions of the Puerperal State	3	—	—	2	1	—	—	—	1	—	—	—	1	—	—	—
Puerperal Diseases of the Breast	2	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—
TOTAL	214	14	35	57	39	42	23	4	269	9	54	66	62	44	29	5

6. *District Nursing.*—As stated in last year's report, an important step in furthering public health work was taken when on 1st May, 1934, a new section for child welfare and maternity services was opened. A woman assistant health officer and three nurse lecturers were appointed, and during the year they carried out an extensive survey of the Union (now nearly completed) to ascertain the most urgent needs of the country districts, the availability of nursing service, the general social and economic condition of the people, and any other information likely to be useful. They also gave practical advice as to the establishment and running of infant and antenatal clinics, and suggested lines on which the local women's organizations and other interested bodies could co-operate with local authorities in order to inaugurate nursing services.

No Government funds were available during the year to establish a nursing service, but funds were voted for this purpose during the Parliamentary Session of 1935, when the Public Health (Amendment) Bill was introduced and became law as from 1st July, 1935—Act No. 57. Three sections of this Act, Nos. 13, 14 and 15, refer to district nursing.

Section 13 provides for refunds to Provincial Councils of one-half the subsidy payable by them to a hospital board in connection with any expenditure incurred by the board in establishing or maintaining a nursing service for its area. This provision was inserted as an inducement to Provincial Councils to foster similar schemes to the excellent service inaugurated under the hospital law of the Cape by the Cape Hospital Board.

In areas where such service cannot reasonably be provided by a hospital board, section 14 empowers the Minister either to refund one-third of the salary paid by any local authority or charitable association or public body which employs a full-time nurse or midwife for district nursing, or where circumstances warrant it, to subsidize a private nurse or midwife engaged in private practice in an area. In exceptional circumstances, the Minister may appoint a full-time nurse or midwife in the area concerned. In every instance, the nurse or midwife referred to must be registered as a certificated nurse or midwife with the South African Medical Council.

To provide for the needs of native reserves and locations, section 15 enables the Minister to make refunds up to a similar amount on the salaries of registered nurses and midwives and native nursing assistants employed by charitable bodies, mission hospitals or statutory native bodies on district work or to subsidize nurses and midwives or native nursing assistants practising in such areas. The same section enable the Minister to employ in a whole-time capacity, nurses and midwives and native medical and nursing assistants.

It will, of necessity, owing to the shortage of nurses and midwives, be many years before a complete rural nursing service can be established. The policy of the Department will be where there are suitable hospital boards to encourage such boards to provide as satisfactory a service as possible; where this is not practicable, to encourage local bodies to employ a nurse or midwife with the statutory refund from the State. Failing such bodies, to subsidize private nurses to start practice in areas where district nurses are sorely needed and, lastly, when all else fails and in very exceptional circumstances, to make whole-time appointments.

It is obvious that the primary need of the rural areas at present is for trained midwives. When these are provided it will be possible gradually to replace the untrained women who are now the only helpers of the unfortunate mothers in many country districts. As an ultimate ideal not likely to be realized in a generation, it is hoped to provide nurses who are fully trained both as nurses and midwives and have also certificates of mothercraft and sanitation. Whatever nurses are appointed under the scheme, the Department will require a portion of their time to be devoted to educative work, and it is hoped that the teaching of hygiene and preventive medicine by the nurses will accomplish much good. Not much of course can be expected for a girl who has had one year's training as a midwife, but even with her a commencement can be made in the teaching of simple hygiene which should prove a real boon to the community.

Many districts cannot at present support a nurse or midwife in private practice. No nurse can be expected to settle down to work in such a district if she is not able to earn a living there. To such a nurse the Government subsidy should at any rate assure a decent living.

7. *Supply of Nurses and Midwives.*—The shortage of nurses noted in former annual reports continues, and threatens to become a serious problem in the establishment in the near future of an efficient district nursing service. Many hospitals are having difficulty in obtaining qualified staff nurses and sisters, though this evidently does not apply to all, and the list of girls waiting to start training at most of the larger hospitals remains a very long one. If nurses are to be persuaded to settle down to do private work in very lonely country districts, the inducement offered in such ways as salary, subsidy, board and lodging, and transport, must be sufficient to compensate for the many disadvantages.

An Afrikaans text-book for midwives—" Beknopte Handleiding vir Kraamverpleegsters "—compiled by Dr. R. S. Verster, was published in March, 1934, and should supply a long-felt need in this direction.

The keeping of lists by urban local authorities of persons practising midwifery has not in many instances been properly carried out, and it is regrettable that in some towns where trained midwives are available and sufficient far too many unqualified women are kept on the lists, a large number of them being unsuited by age or physical condition for doing any useful work. This matter is receiving the attention of the Department, with the result that " gamps " are slowly being eliminated.

8. *Nursing and Maternity Homes.*—As no reference was made to nursing and maternity homes in the last annual report, the activities of these establishments are now reviewed for the two year period ended 30th June, 1935.

(*a*) *Registration.*—Returns for the year ended 30th June, 1934, show that 39 new nursing homes were approved for registration, while 50 were reported closed, the corresponding figures for the year ended 30th June, 1935, being 52 and 73, respectively. Registrations also include the taking of new premises by establishments already on the registers of the Department. During the year ended 30th June, 1934, one nursing home was ordered by the Minister to be closed on account of being unsuitable, while another home was similarly dealt with during the year ended 30th June, 1935.

Registrations for the past seven years are given in Table P (i). From this it will be noted that while there is comparatively little fluctuation in the number of nursing homes for the first five years, there was a phenomenal increase in their number during the last two years, especially in the Cape and Transvaal Provinces. The total of nursing establishments registered in the Union rose from 276 in 1933 to 324 in 1935.

TABLE P (i).—NURSING HOMES REGISTERED WITH THE DEPARTMENT.

Year.	Cape.	Transvaal.	Natal.	Orange Free State.	Total.
1928–29	104	90	43	26	263
1929–30	124	91	54	29	298
1930–31	110	98	51	25	284
1931–32	95	94	44	26	259
1932–33	105	100	46	25	276
1933–34	115	103	43	28	289
1934–35	126	128	42	28	324

(*b*) *Inspections.*—The improvement in registration figures is to a considerable extent due to the activities of the lady inspectors appointed in 1934. Their regular inspections have resulted not only in undesirable premises going out of commission, but also in bringing under the operation of the nursing homes regulations, nursing homes that were not previously recognised by the Department. The inspections of nursing establishments for the past three years are reflected in Table P (ii).

TABLE P (ii).—NURSING AND MATERNITY HOMES INSPECTED DURING THE YEARS ENDED 30TH JUNE, 1933, 1934 AND 1935, RESPECTIVELY.

Place.	Inspections.					
	By Medical Officer of Local Authority.			By Department and Other Government Officer.		
	1933.	1934.	1935.	1933.	1934.	1935.
Cape Province.						
Capetown	8	4	1	—	—	—
East London	—	—	2	—	—	3
Port Elizabeth	7	8	1	—	—	—
Elsewhere	2	9	2	—	5	49
Natal Province.						
Durban	1	—	19	—	—	—
Pietermaritzburg	1	1	3	—	—	—
Elsewhere	2	—	—	—	9	9
Transvaal Province.						
Johannesburg	2	1	35	—	—	—
Pretoria	1	—	11	—	—	—
Elsewhere	2	5	1	14	45	32
Orange Free State.						
Bloemfontein	—	1	—	—	—	—
Elsewhere	1	—	—	1	9	10
UNION	27	29	75	15	68	103

Inspections for the past two report years are an indication of the amount of field work done by the Deparmental lady inspectors (nurse-lecturers) especially in rural areas where for years, owing to lack of staff for the purpose, this work could not be carried out. This " field work " has done a vast amount of good in that it has brought to light unsatisfactory, unhygienic and unauthorised nursing home practices which have in the discretion of the Department been stopped, while at the same time causing to be placed on its register of nursing homes such establishments as were found to be generally satisfactorily equipped and under qualified management.

Inspections of the small country towns have shown that very many nurses, qualified and unqualified, admit patients to their houses for nursing purposes. These are usually maternity cases, and, in some instances, an unqualified woman has in the course of years achieved a reputation in the district for obstetrical skill which makes her a formidable rival to the progress of any qualified nurse starting in opposition; the reputation is not always deserved, and the actual circumstances in the nurse's home are sometimes so bad that patients would be as well or better off in their own miserable surroundings. In isolated cases these untrained women's homes are well and efficiently run.

The usefulness of having one or two beds available in the home of a trained nurse or midwife, especially in places where there is no hospital near, is apparent in all our inspections. A district nurse can accomplish more good work in this way than by having to travel long distances, necessarily at long intervals, to nurse such cases in their own homes.

The question of the registration of mission hospitals with the Department is one which at present needs consideration; the majority of them being regarded as nursing homes " not carried on for gain ", are not registered and are not under any control. Many of them ask for registration and welcome the infrequent visits of an inspector from the Department, who can advise and help them on many points. There does not appear to be any logical reason why some should be registered and others not; some which receive provincial grants are registered with this Department, while others also receiving such grants are not. In the great majority of cases the fees charged are nominal, but in others the mission hospital is quite definitely used by doctors for their private paying patients, and the fees charged are in accordance.

The inspections of nursing homes which have been carried out by the nurse-lecturers in rural areas have caused a large number of improvements to be carried out and, as it is an undoubted advantage to have such places under the control of the Department, as it provides a source of technical advice and guidance for those in charge of the homes. It is, however, a matter for regret that in a few instances the nurse-lecturers have been received with marked discourtesy.

(*c*) *Regulations.*—The regulations regarding nursing and maternity homes were revised during the early part of 1935, and were published under Government Notice No. 856 of 21st June, 1935. There are two essential changes:—

(1) The forms of patients' registers have been simplified, and are now supplied in two separate forms—one for non-maternity patients (Schedule C) and one for maternity patients (Schedule D).

(2) Under regulation 4 (2) an unregistered nurse or midwife can, in certain areas where the Minister is satisfied that no suitable facilities exist, apply to open a nursing home there, and may be allowed to do so, but the home may not be registered for more than six months at a time.

Every registered home in the Union was supplied with a copy of the new regulations under a departmental circular of instructions.

(*d*) *Activities of Nursing Homes.*—The returns from nursing homes for the year ended 30th June, 1934, are analysed in Table P (iii). In this table is shown the number of European, Coloured, Native and Asiatic patients admitted.

TABLE P (iii).—PATIENTS TREATED AND CASES HANDLED BY NURSING HOMES.

Service.	Europeans.	Coloureds.	Natives.	Asiatics.	Total.
Admissions	34,841	686	5,498	663	41,688
Discharges	31,656	625	5,089	617	37,987
Deaths	1,014	11	304	37	1,366
Operations	20,415	16	505	43	20,979
Confinements	5,114	447	1,000	174	6,735
Patients nursed outside home	1,526	82	35	152	1,795
Confinements attended outside home	1,476	471	144	59	2,150

Most nursing establishments in rural areas have considerable out-patient practices. A number of homes in the larger urban areas also cater for this service, but to a lesser extent.

(*c*) *Bed Accommodation.*—From the returns rendered by nursing homes for the year ended 30th June, 1935, it was remarkable to note how many establishments had reduced the number of their beds in use. Only a few of the larger ones had increased the number. When the totals for the report year 1934 are compared with those for the year ended 30th June, 1935, as in Table P (iv), it is seen that the position was not only maintained, but considerably improved. This is especially marked in the case of the Cape and Transvaal Provinces.

TABLE P (iv).—BED ACCOMMODATION AVAILABLE IN NURSING HOMES.

Cape Province:		
Capetown and Peninsula	476	
East London	56	
Port Elizabeth	129	
Queenstown	44	
Stellenbosch	58	
Rest of Province	349	
	1,112	(1934–1,064)
Transvaal Province:		
Johannesburg	683	
Rand Municipalities	238	
Pretoria and District	125	
Rest of Province	188	
	1,234	(1934–1,044)
Natal Province:		
Durban	326	
Pietermaritzburg	108	
Rest of Province	603	
	1,037	(1934–1,044)
Orange Free State Province:		
Bloemfontein	68	
Rest of Province	123	
	191	(1934–180)

9. *Birth Control Clinics.*—During recent years the necessity for the teaching of birth control methods has been widely recognized and has been openly advocated by many leading authorities, both in the medical world and the field of social workers.

The practice of birth control, up to the present, has been mainly among those sections of the community which are able to afford the necessary medical advice. This advice has been beyond the reach of the poor, who are often also the sick and diseased, and who would most benefit by the reasonable limitation of the size of their families.

The reports received from country district all lay stress on the dire poverty, the lack of all the ordinary comforts of life, the overcrowding, and the difficulty of obtaining any medical or nursing help in time of sickness—particularly trained help for the women in childbirth. It is not uncommon to find father, mother and three or more children all sleeping in the same bed.

In addition to the more than ordinary dangers and difficulties that women in such circumstances have to face during childbirth, is the impossibility of finding food, clothing and schooling for one more child. These people, whose social, economic and often physical and mental conditions are of the lowest, are those who should be shown how to space and limit their families. More practical good could be accomplished by this teaching than by any other method, but the teaching would have to be carried out by experienced nurses under medical supervision, and the people cannot pay for the service.

In the towns, the establishment of birth control clinics has advanced during the last three years, and there are now six towns running clinics—Capetown, Johannesburg, Pretoria, Port Elizabeth, East London and Benoni. All these clinics are run on much the same lines, with medical women and trained nurses in attendance, and the fees charged are the minimum to cover the cost of necessary appliances.

The Capetown clinic is in receipt of a grant of £50 per annum from the municipality, £25 per annum from the Cape Divisional Council and this year, for the first time, will receive a grant from the Provincial Council. Port Elizabeth, Johannesburg and Pretoria will receive municipal grants this year.

The services rendered by these urban clinics are great, but they do not touch the rural areas, where they might also be so usefully applied.

10. *General Hospitals.*—The system of routine inspection on behalf of the Provincial Administration of the State-aided hospitals and kindred institutions in the Cape Province, Orange Free State and the Transvaal was continued during the year. As in previous years, the hospitals on the Reef and in Pretoria were inspected by the members of the Public Hospitals Advisory Council, while twenty hospitals and aided charitable institutions were inspected and reported on by an assistant health officer of this Department as opportunity arose. Owing to a shortage of professional officers it was found impracticable to inspect all the institutions in the three Provinces mentioned during the year under review, but the inspections are being systematically continued and it is hoped that no institution will be left for too long without a routine inspection by an assistant health officer. It is satisfactory to note that steady progress is still being made towards meeting the demands for hospital accommodation in certain areas and generally in improving conditions in the older hospitals of the Union. The position of the State-aided hospitals in the Cape, Orange Free State and Transvaal Provinces, exclusive of the purely State institutions and those receiving a fixed grant-in-aid annually, is at present as follows:—

Cape Province	52
Transvaal Province	28
Orange Free State Province	9

The hospitals in Natal are State institutions with the exception of one which is subsidised.

In the Cape Province the work on the superstructure of the new Central Hospital in Capetown is making satisfactory progress. The schemes for modernising the hospitals at Kimberley and Queenstown which were commenced last year are now nearing completion. During the year a new hospital was opened at Mount Fletcher. This institution was erected with funds made available by the trustees of the Tyler Bequest, from which source the hospital at Matatiele was also erected some few years ago. Plans for extensions to the institutions at Kokstad, Uitenhage, East London, Upington, Stellenbosch, Oudtshoorn, Cradock, Port Elizabeth, Matatiele, Wynberg, and Worcester were prepared and submitted to the Department for examination and report. Two schemes for entirely new hospitals at De Aar and at Alice were prepared and approved of during the year. The former is intended to provide accommodation for approximately40 patients while the latter will provide accommodation for about 8 European patients only. The erection of both these hospitals will no doubt be proceeded with in the near future. A proposal for the establishment of a hospital in the vicinity of Somerset West was also considered during the year, but it is not known to the Department what stage this scheme has reached. A hospital in this town is definitely not required.

The Port Elizabeth Hospital Board has now appointed an all time medical superintendent in charge of its institution. During the year under review a Departmental inquiry into the general management of the Frere Hospital, East London, was carried out by Dr. A. J. van der Spuy, an Assistant Health Officer in the Department. As recommended by him, the hospital board has also appointed an all time medical superintendent in charge of the Frere Hospital.

In the Transvaal Province new hospitals were opened at Vereeniging and at Volksrust, while plans were prepared and passed for a hospital at Piet Retief and at Potgietersrust. A scheme for rebuilding the entire European section of the Middelburg Hospital was also submitted and after consideration it was recommended that the scheme be held in abeyance for the time being. A proposal to build an entirely new and larger hospital on a more suitable site at Klerksdorp was also submitted for consideration, but no decision on the matter is being arrived at pending further information as to the need of hospital accommodation for the whole area. Plans were prepared and passed for extensions to the hospitals at Johannesburg, Germiston, Springs, Krugersdorp, Bethal, Rustenburg, Pretoria and Witbank, and these schemes will no doubt be carried out in due course.

In the Orange Free State the new Hospital Ordinance, No. 13 of 1933, has now been in force for over a year and, generally speaking, has proved satisfactory as far as hospital boards are concerned. The scheme for the erection of a new maternity home on the National Hospital site at Bloemfontein, which was authorised by the Provincial Administration last year, has not yet been completed. Plans for a hospital at Heilbron were submitted

and passed while plans for extensions to the Harrismith Hospital were similarly dealt with. Drainage schemes for the improvement of the hospitals at Clocolan and Ladybrand were also approved. A proposal to acquire a property in Winburg with the object of establishing a small hospital in that centre was also submitted for consideration, but the necessary formalities required by the Ordinance for the establishment of a hospital board have not yet been complied with.

The hospitals in the Natal Province are not inspected by the medical officers of this Department, but as far as is known there is practically no change in the hospital position in this Province. It is understood that a scheme for the erection of a new non-European hospital at Congella is now in progress.

Chronic Sick Hospitals.—The Cape Provincial Administration has prepared a scheme for the erection of a new chronic sick hospital near Capetown, and, during the year, the plans were submitted and finally approved of. It is anticipated that building operations will be commenced in the very near future. During the year certain extensions and improvements were carried out to the Prince Alfred Infirmary at Grahamstown.

Last year the Transvaal Provincial Administration had plans prepared by a private architect for the complete remodelling and enlarging of the chronic sick hospital at Rietfontein, near Johannesburg. On further examination, however, it was found that the plans were unsuitable for the site and the scheme is now being prepared departmentally.

Up to the present no chronic sick hospital has been provided in the Orange Free State Province, though a few beds for chronic sick European patients are available in the Bloemfontein Municipal Isolation Hospital at Tempe. The need for accommodation for incurable cases in the Province is a very real one.

The chronic sick hospital for Natal, situated at Hillcrest, near Durban, provides accommodation for approximately 100 patients.

11. *Habit-forming Drugs.*—The enforcement of the regulations regarding opium, dagga and other habit-forming drugs, continues to be carried out. This is done in co-operation with the Police, Commissioner of Customs and Excise and Postmaster-General. The following table shows the prosecutions and convictions:—

TABLE Q.—PROSECUTIONS AND CONVICTIONS UNDER LAWS RELATING TO HABIT-FORMING DRUGS DURING THE PERIOD 1ST JULY, 1934, TO 30TH JUNE, 1935.

Province.	European.		Native.		Asiatic.		Other Coloured.		Total.	
	Prosecutions.	Convictions.	Prosecutions.	Convictions.	Prosecutions.	Convictions.	Prosecutions.	Convictions.	Prosecutions.	Convictions.
Cape.....	57	49	617	581	8	6	933	902	1,615	1,538
Natal.....	69	57	1,954	1,901	44	41	28	28	2,095	2,027
Transvaal.....	57	56	2,291	2,219	15	15	267	261	2,630	2,551
O.F.S.....	7	7	313	302	—	—	31	31	351	340
UNION.	190	169	5,175	5,003	67	62	1,259	1,222	6,691	6,456

Of the total of 6,691 prosecutions, 6.685 were in respect of dagga and 6 of other habit-forming drugs. 27 ounces of opium and large quantities of dagga were seized and confiscated.

The total quantities of habit-forming drugs imported into the Union during the year ended 30th June, 1935, were:—Opium, Raw, 800 lb.; Opium, Medicinal, 79 lb. 2,188 grains; Opium, in the form of tinctures, etc., 58 lb. 6,692 grains; Morphine, 42 lb. 5,858 grains; Heroin, 15 lb. 3,955 grains; Cocaine, 31 lb. 1,413 grains; Coca Leaves 56 lb.; and Cannabis Indica, 170 lb. 4,144 grains.

The following habit-forming drugs were exported from the Union during the period under review:—Opium, Raw, ½ lb.; Opium, Medicinal, 2 lb. 900 grains; Opium, in the form of tinctures, 11 lb. 4,976 grains; Morphine, 3,530 grains; Heroin, 1,446 grains; Cocaine, 6,204 grains.

Every chemist and druggist or other person who ordinarily stocks habit-forming drugs, is required, in terms of Chapter 6 of Act No. 13 of 1928, to keep a register properly named and reflecting the quantity of the drug possessed, imported, or acquired by him, the date of importation or acquisition of the drug, the person from whom and the place from which the drug was imported or acquired, the quantities sold, supplied, used or administered,

the purpose for which used, and the date of use, or the name and address of the person to whom sold, supplied or administered, and the date thereof. In the many instances where the registers were found not to be properly kept, warning notices were issued and generally proved sufficient to ensure compliance with the legal requirements.

Act No. 13 of 1928 makes it definitely illegal for a practitioner to prescribe a habit-forming drug to an addict to satisfy a craving for the drug. Medical practitioners may of course prescribe habit-forming drugs for a definite curative or therapeutic purpose, but not to satisfy a craving, and no chemist may make more than two issues on the same prescription or order. Every order or prescription must contain the name and address of the person for whom the drug is required or prescribed and the name, address and qualification of the person signing such order or prescription. During recent inspections of chemists' registers it became evident that some medical practitioners were not complying with the requirements of the law through ignorance of its provisions or through carelessness. The co-operation of the Medical Association of South Africa has been sought in advising its members of the requirements of the law.

Dagga Smoking.—The allegation that natives were being senselessly prosecuted for smoking an entirely harmless substance called "dagga", to which considerable newspaper publicity was given, was made the subject of very careful investigation. It was alleged that the bulk of the natives prosecuted were in the possession of the harmless substance *Leonotis* or "Cape Wild Dagga". This is admittedly little, if any, more harmful to the smoker than ordinary tobacco; if persons were suffering penalties for having this in their possession then clearly it would be necessary to alter the regulations and legal procedure. The medical man who made the allegation is reported to have stated that he knew of several actual instances where persons had been prosecuted and convicted for being in possession of *Leonotis*.

It was accordingly arranged to have tested by experts all available samples of dagga which had led to convictions, to ascertain whether any appreciable number of persons were being convicted for being in possession of the comparatively harmless *Leonotis*. In the dried form in which it is used for smoking it may be difficult to distinguish the habit-forming hypnotic *Cannabis* from *Leonotis*. On the other hand it seemed unlikely that addicts would risk prosecution by having in their possession a substance incapable of satisfying their craving.

The police authorities readily co-operated in this investigation. They collected samples from supplies that had been in the possession of persons convicted for being in possession of "dagga". Samples were obtained from the police in all four provinces. They were submitted for examination to an expert in each area: in Pretoria, the Principal Botanist, Division of Plant Industry; in Johannesburg, to the Department of Pharmacology, University of the Witwatersrand; in Natal, to the Mycologist-in-Charge Natal Herbarium; in Capetown, to the Department of Pharmacology, University of Capetown. In all 1,123 specimens were examined by experts, and *without a single exception* they were found to consist of *Cannabis* and not *Leonotis*.

Professor J. M. Watt and Dr. Maria Breyer-Brandwijk, of the University of the Witwatersrand, decided to make a scientific study of the dagga problem in the Union, and they prepared a paper, entitled "The Forensic and Sociological Aspects of the Dagga Problem in South Africa", for submission to the Congress of the Medical Association which was held in Grahamstown early in October, 1935. The samples collected in Capetown and Pretoria were examined by them as well as by the experts in the centres indicated. The findings coincided in all these cases.

The results of this investigation were truly surprising. One was prepared to find that occasionally a mistake might have been made by the police since in the dried pulverised form *Leonotis* is not very easily distinguishable from *Cannabis*. The explanation is probably, firstly, that the police officials are well trained in the recognition of *Cannabis*; and, secondly, that addicts are even better able to recognise it; they will not be put off by a substance which does not satisfy a craving, particularly when they are already running grave risk of legal action.

Satisfactory as the result of this investigation has proved, it ought not really to have been necessary at this late stage. When legislation was originally enacted, the matter had been carefully and scientifically investigated. The fact that "dagga" in the form smoked was a dangerous habit-forming hypnotic; that the habit of smoking it was spreading; and that it was something from which persons not yet addicted should be protected had been proved by early investigations. The legislation was deliberately worded as it was to prevent the necessity of expert witnesses having to be called to prove the possession of *Cannabis* and the investigation has shown that

Parliament acted wisely in the matter in spite of the possible loophole that convictions might be obtained in error by the use of the terms "Dagga", "Intsangu" or "Indian Hemp" in the Fifth Schedule of the Medical, Dental and Pharmacy Act, 1928.

12. *Anaesthetics.*—The relatively heavy death rate in the Union in connection with the administration of anaesthetics during surgical operation unfortunately continues. Every such death is now immediately reported to the Department and all the circumstances under which it occurred are carefully inquired into, with a view to the possibility of measures being introduced which may tend to lessen the mortality.

In the accompanying table the deaths that occurred in connection with 43,510 operations carried out in the larger hospitals of the country during the year are analysed. Amongst these there occurred a total of 50 deaths, or 1·15 per 1,000 operations. Last year the rate was 1·57, the year before 1·26 and the year before that 1·90. Though the death rate has fallen it still continues to be disquietingly high.

TABLE R (i).—DEATHS DUE TO ANAESTHETICS DURING YEAR ENDED 30TH JUNE, 1935.

Anaesthetic.	Number of Operations.	Deaths on Table due to—					Per 1,000 Anaesthetics.
		Anaesthetic.	Anaesthetic and Shock.	Operation while Moribund.	Surgical Accident.	Total.	
Ethyl Chloride and Ether	10,455	2	5	3	2	12	1·15
Chloroform and Ether..	13,565	6	1	6	2	15	1·11
Gas and Oxygen.....	1,533	—	2	3	1	6	3·91
Ether.....	1,547	1	2	2	—	5	3·23
Chloroform.....	874	1	1	3	—	5	5·72
Spinal.....	586	—	—	—	—	—	—
Local.....	9,780	—	—	—	—	—	—
Ethyl Chloride.....	2,514	—	1	—	—	1	0·40
Avertin.....	378	—	—	—	1	1	2·58
Not specified.....	2,269	2	1	2	—	5	2·20
	43,510	12	13	19	6	50	1·15

A carefully prepared questionnaire has been drawn up in consultation with expert anaesthetists and pharmacists for the guidance of medical superintendents of hospitals in submitting reports on these deaths. When sufficient data have been collected it is proposed to appoint a committee of experts to investigate the whole subject of anaesthesia under South African conditions. Arrangements have also been made to have the anaesthetic used in each case analysed free of charge to the hospital where considered necessary. A little time must still elapse before sufficient information will have been collected to make a satisfactory examination of the whole matter possible. Meanwhile it would appear that the careful inquiry following each death attributable to anaesthesia is having a useful effect. It is probable that the definite fall in the death rate during the year under review may be attributed to greater precautionary measures having been instituted.

In Table R (ii) is given a summary of the deaths connected with operations performed in the main hospitals of the Union during the last five years.

TABLE R (ii).—DEATHS DUE TO ANAESTHETICS DURING PERIOD 1931-1935.

Anaesthetic.	Number of Operations.	Deaths on Table due to—				Total.	Per 1,000 Anaesthetics.
		Anaesthetic.	Anaesthetic and Shock.	Operation while Moribund.	Surgical Accident.		
Ethyl Chloride and Ether	51,501	22	47	39	4	112	2·17
Chloroform and Ether.	73,908	32	30	31	3	96	1·30
Gas and Oxygen.....	4,722	1	6	9	1	17	3·60
Ether.....	6,271	2	6	24	—	32	5·10
Chloroform.....	3,605	7	3	5	—	15	4·16
Spinal.....	2,040	—	4	2	—	6	2·94
Local.....	35,183	—	1	6	—	7	0·20
Ethyl Chloride.....	12,858	2	2	4	—	8	0·62
Avertin.....	1,387	1	3	—	1	5	3·61
Not specified.....	4,574	2	2	3	—	7	1·53
TOTAL.....	196,049	69	104	123	9	305	1·57

13. *Adulteration or False Description of Food, Drugs and other Articles.*—The following Table reflects the administrative measures taken during the year under the Food, Drugs and Disinfectants Act No. 13 of 1929:—

TABLE S.—SAMPLES TAKEN FOR EXAMINATION OR ANALYSIS UNDER ACT NO. 13 OF 1929, DURING THE YEAR ENDED 30TH JUNE, 1935, AND THE RESULTS.

Place.	Total Taken.	No. Analysed or Examined.	No. found Adulterated or Incorrectly or Falsely Described.	Prosecutions.	Convictions.	Remarks.
Ports of Union.....	162	157	7	—	—	In respect of 23 warnings *re* labelling or standard were issued; 67 were detained pending relabelling; 5 were destroyed.
Cape Province.....	2,085	2,071	318	104	79	—
Natal Province.....	482	449	43	16	10	—
Transvaal Province..	1,574	1,562	185	86	65	—
Orange Free State Province.....	204	203	13	12	11	—
TOTAL.....	4,477	4,442	566	218	165	—

Imported Articles Dealt with at Ports of the Union (including Inland Customs Ports of Entry).—This work is undertaken with the co-operation and assistance of the Department of Customs and Excise, and during the year a total of 162 samples were submitted for analysis or examination, made up of 67 from Capetown, 30 from Johannesburg, 36 from Port Elizabeth, 4 from East London, and 25 from Durban. Of these 7 proved not to be up to standard, 23 warnings were issued on account of defective labelling, 67 consignments were released after relabelling in customs and 5 consignments were destroyed. The articles embraced cheese (59 samples), disinfectants (23 samples), vegetable fat (13 samples), malt extract (9 samples), frying oil and fish and fish pastes (8 samples each), confectionery, creams and milk powder (6 samples each), condensed milk and ghee (5 samples each), tinned peas and drugs (2 samples each), and butter preservative, cherries, custard powder, egg albumen, fruit juice, margarine, meat, pepper, sauce and yeast (1 sample each).

Sampling by Local Authorities.—No fresh delegations in terms of section 2 (3) of the Act were made during the year, and the number of municipalities which have authority to undertake the sampling in their areas of perishable articles as also flour, meal, bread and other articles not packed or sold in sealed packages remains at 27, namely 10 (Capetown, East London, Graaff-Reinet, Grahamstown, Kimberley, Kingwilliamstown, Paarl, Port Elizabeth, Queenstown and Uitenhage) in the Cape Province; 13 (Benoni, Boksburg, Brakpan, Germiston, Johannesburg, Krugersdorp, Nigel, Potchefstroom, Pretoria, Randfontein, Roodepoort-Maraisburg, Springs and Vereeniging) in the Transvaal Province; 2 (Bloemfontein and Kroonstad) in the Orange Free State Province; and 2 (Durban and Pietermaritzburg) in Natal Province. Under the arrangement in force each local authority is entitled to the examination or analysis, free of charge in a Government laboratory, of a number of samples annually calculated on the basis of four samples per thousand of the European population at the last census. During the year a total of 2,201 samples were taken by local authorities under the delegated powers mentioned (namely, 816 in the Cape Province, 929 in the Transvaal Province, 361 in Natal Province and 95 in the Orange Free State Province) of which 351 were found to be adulterated. Proceedings were instituted in 151 cases resulting in 108 convictions. The more important articles analysed included, 1,670 milks (248 adulterated), 103 ice creams (36 adulterated), 24 butters (4 adulterated), 16 cheese (4 adulterated), 12 lards (1 adulterated), 12 honeys (2 adulterated), 97 meat and fish preparations (23 adulterated) and 36 meal and flour (none adulterated).

Sampling by the Department.—In addition to sampling carried out by four inspectors of the Department, two of whom are stationed in Capetown, one in Durban and one in Pretoria, purchases in the smaller urban areas are carried out with the co-operation of the police and in the Johannesburg municipal area with the assistance of the Council's inspectors as regards milks sampled on railway premises and such other articles as the Council does not itself deal with under the delegated powers mentioned in the preceding paragraph. Out of a total of 2,114 samples submitted for analysis, 218 were found to be adulterated in respect of which 67 prosecutions were instituted resulting in 57 convictions and the imposition of fines totalling £143. 10s. The more important articles analysed included:—

Food Articles.—Milks, 1,356 (92 adulterated); ice creams, 41 (22 adulterated); bread, flour and meal, 24 (none adulterated); pea-nut butter, 12 (3 adulterated); coffees and chicory, 87 (11 adulterated); honey, 26 (4 adulterated); chutneys and sauces, 26 (4 adulterated); dried fruits, 73 (30 adulterated); meat and fish, 60 (19 adulterated); lard, fats and cooking oil, 23 (1 adulterated); pepper, 27 (none adulterated); custard powder, 7 (1 adulterated); jam, 11 (none adulterated); baking powder, 10 (2 adulterated); mineral and aerated waters, 91 (4 adulterated); fresh fruit, fruit juices and cordials, 62 (17 adulterated); cocoa, 3 (1 adulterated) and essences, 4 (2 adulterated).

Soaps.—Of 15 samples analysed 1 proved not to be up to standard.

Drugs and Medicines.—56 Samples were analysed and 1 found to be below standard.

Disinfectants.—Exclusive of 23 samples examined on importation, 20 samples were purchased in the Cape Province; of the latter 3 were found to be below standard or incorrectly labelled.

A matter which gave cause for concern during the year was the practice in vogue of dumping on the local market for consumption quantities of fresh fruit rejected for export, on account of containing excess arsenic. Samples of dried pears which were taken for analysis also revealed the presence of arsenic in excess of the quantity permitted under the regulations. Information had been received of suspicious occurrences of diarrhoea and vomiting probably due to arsenic, and as an outcome of representations on the subject made by this Department the following Press service was issued on the 19th March, 1935, by the Department of Agriculture and Forestry, as a warning to producers; notwithstanding this warning, however, it was found that at Capetown alone during the months of March and April, 1935, 4,212 boxes of fresh pears and 73 boxes of fresh apples had been rejected on account of excess arsenic—an indication that growers are taking little notice of the warnings issued and that the protection of consumers in this country against risks of arsenical poisoning is not likely to be achieved until a series of cases are brought before the courts:—

"Arsenic in Fresh and Dried Fruit.

The attention of all dried-fruit producers as well as sellers of dried and fresh fruit is urgently drawn to section 3 (2) of Act No. 35 of 1917. Under this Act the Minister of Agriculture and Forestry is empowered to have all dried fruit tendered for export but not passed on account of an excessive arsenic content, destroyed.

Furthermore, attention is also drawn to regulation No. 3 (2) of 1929 of the Union Department of Public Health, which lays down that no fresh fruit may be sold in South Africa if it contains more than one-fiftieth of a grain of arsenic per lb. (calculated as arsenious oxide); also no dried fruit may be sold if it contains more than one-hundredth of a grain of arsenic per lb. Any person selling fruit containing arsenic in excess of the above proportion renders himself liable to prosecution and, if convicted, to a fine not exceeding £50.

The Secretary for Public Health has also intimated that he intends vigorously to enforce the provisions of the above regulation as from 1st July, 1935, on account of cases of illness which are stated to have been caused by excess arsenic in fresh and dried fruit.

The method of removing arsenic from fresh pears and apples is well-known to all exporters of these fruits, and is moreover described in detail in Department of Agriculture Reprint No. 14 of 1932. It appears, however, that often pears and apples are sold on the local markets without having been washed in dilute hydrochloric acid in order to remove the arsenic. This procedure usually incurs a definite contravention of the Public Health regulation referred to above.

The producers of dried pears are responsible for an even more serious contravention of the above regulation. The custom with many producers of dried pears is to first separate the culls from the best fruit, and then to remove the arsenic from only the best fruit which is packed for export. The culls or, where exporting is not resorted to, the whole crop is allowed to ripen and is then dried, without any attempt having been made to first remove the arsenic. In such cases a serious excess of arsenic may be found in the dried product, because it must be remembered that by drying the fruit the amount of arsenic in a pound of dried fruit may amount to five times the quantity in the original fresh fruit.

Before drying pears, therefore, producers should be careful to wash the fruit thoroughly in dilute hydrochloric acid according to the method described in Department of Agriculture Reprint No. 14 of 1932, obtainable from the Chief, Division of Plant Industry, Pretoria.

It cannot be too strongly emphasized that even greater care should be taken with pears intended for drying than with fruit intended for consumption in the fresh state.

The above Acts have not been strictly enforced in the past, owing to the fact that dried-fruit producers were not fully acquainted with the best and most economical methods of removing arsenical spray. They have now, however, been fully advised in this connection, and in view of the deleterious effect of an excess of arsenic to the health of consumers, the enforcement of the provisions of the Acts referred to cannot be further delayed.

All dried-fruit producers and exporters are therefore hereby warned that after 1st February, 1935, steps will be taken by the Department of Agriculture and Forestry under section 3 (2) of Act No. 35 of 1917, to destroy all dried fruit submitted for export but not passed on account of an excessive arsenic content, and further that the Department of Public Health will strictly enforce their regulation No. 3 (2) of 1929 as from 1st July, 1935."

Another occurrence during the year calling for comment was a request made by a deputation of Capetown millers that No. 12 (1) (*a*) of the regulations framed under Act No. 13 of 1929 be amended so as to permit of the use of improvers in the treatment of flour milled from wheat grown in the Cape Province. The millers felt very strongly that, owing to the fact that wheat grown in the Orange Free State and Transvaal is harder and makes a stronger flour and the millers in the Cape having to use the wheat grown in that province, which is softer and cannot by any ordinary mechanical means be made equal in body to flour milled from northern wheat, they should be permitted to use certain improvers of a character not detrimental to health as otherwise the consuming public in the southern portion of the Union cannot enjoy the character and quality of flour which they could do if some modification of the regulations was made to enable millers to meet requirements under the special circumstances mentioned. It was further represented that the position was formerly met by mixing a small quantity of the much stronger Canadian flour with the Union product but this practice could not be continued as a result of the embargo placed by Government on the importation of Canadian wheat. The information before it did not convince the Department that a strong case had been made out for an amendment of the regulation in question, especially as there appeared to be no reason why the hard wheat formerly imported from Canada to strengthen the Cape weak wheats could not be replaced by hard wheat grown in the Transvaal, and after consultation with the Department of Agriculture and Forestry and also the Transvaal Millers Association it was decided that a departure from the existing provisions of the law was not warranted.

As a result of the accidental administration to an infant by a native servant of essence of vinegar in mistake for gripe water, it was decided to test the acid content in the first-mentioned preparation. The district surgeon who was called in to attend the infant ,which subsequently recovered, reported that in addition to signs of corrosive action on the lips he was specially alarmed at the amount of stridor difficulty of breathing with well-marked retraction between ribs on respiration. He further expressed the view that in the interests of the public storekeepers should not be allowed to sell essence of vinegar without some indication on the label that as a concentrated preparation of acetic acid it was a dangerous corrosive. Samples of both the white and brown essence were obtained and submitted for analysis, the analytical report disclosing that no acid could be detected in either sample other than acetic acid which was present to the extent of 53·2 per cent. in the case of the white essence and 53·6 per cent. in the case of the brown essence. After ascertaining that essence of vinegar did not fall to be dealt with under the Wines, Spirits and Vinegar Act administered by the Department of Agriculture, the conclusion was come to that, while a notice as to the properties of the essence might on some occasion prevent an unfortunate accident, it was unlikely that any statement on the label of the bottle would render its wrongful administration through carelessness as in this case less likely to occur. The substance does not fall within the Poison Schedule of the Medical, Dental and Pharmacy Act, and the Department was unable to regard the unfortunate accident as affording sufficiently strong reasons for seeking the necessary authority to require it to be labelled as potentially dangerous.

General Warranties.—One new application for the registration of a general warranty, in terms of Section 28 of the Act, was granted during the year. The total number of general warranties registered and in force is now 23.

General.—Inspection tours undertaken during the year by the Department's inspectors in connection with the enforcement of Act No. 13 of 1929 (when the opportunity was also taken of inspecting poison registers which general dealers, having authority to sell poisons, are required to maintain in

terms of the Medical, Dental and Pharmacy Act, No. 13 of 1928, as also habit-forming drugs registers kept by chemists and druggists in terms of the same Act) continued to reveal irregularities which necessitated the issue of a number of written warnings. Although possibly not of such frequent occurrence instances still come to light of the sale by general dealers of patent, proprietary and dutch medicines, containing a poison within the prohibited five-mile radius of a town or village wherein a chemist and druggist is carrying on business; certain amendments to the poison regulations are, however, at present under consideration which it is hoped will prove helpful in more effectively checking this illegal practice.

14. *Unsound Foodstuffs.*—The inspection and examination by port health officers of articles of food imported into the Union at the different ports covered a large variety of articles including instant postum, rice, pickles, bacon, herrings, bean meal, renet, fruit juice, lime juice, tinned cherries, tinned salmon, tinned fish, condensed milk, olives, potted meat, sweet corn, barley, pimientos. Among consignments which were condemned during the year as unfit for human consumption where those of dates (valued at £88), wheat (£50), cooked ham £44), asparagus (£38), sardines (£22), tomato paste (£11. 10s.), spice anchovy (£7. 18s.), preserves and beans £7. 5s. 6d.), yeast food (£5), and 1,151 bags of flour from bonded warehouse (value unknown).

Inspectors of the Department were also active on their inspection rounds in dealing with tinned foodstuffs in country stores and such as proved on examination to be blown were destroyed with the consent of the owners. In towns and villages where there is a constituted local authority, action in this respect is a resonsibility of such authority.

15. *Prevention of Cancer.*—The very valuable propaganda work which is being done by the National Cancer Association of South Africa deserves the full support of the public generally. This Department is represented on the council of the Association along with other Government and Provincial Administration representatives. The association was registered in 1931 as a non-profit association under the Companies Act of the Union, its main objects being—

to make investigations as to the causes and treatment of cancer;
to take steps with a view to the prevention, treatment and combating cancer, and particularly by educating and securing the intelligent co-operation of the public and by directing their attention to the urgent necessity for the treatment of the disease in its early stages;
to establish and aid in the establishment of a National Cancer Institute for the Treatment of Cancer.

It is administered by a council of twenty of whom fifteen are elected by members annually, and the remainder are appointed by the Union Government and Provincial Administrations of the Union. In addition there are executive, publicity, finance and statistical committees.

The association is dependent for its revenue upon donations and the subscriptions of its members. The subscription is 10s. 6d. per annum; a donation of £10 and over in any one year, confers life membership of the association upon the donor.

The following are some of the matters which have been undertaken and carried out by the association:—

In collaboration with this Department, a pamphlet, entitled "Truths about Cancer" was printed, and some 35,000 copies distributed to municipalities, responsible bodies and associations throughout the Union. Pamphlets for dentists, nurses and midwives were also prepared by the association and distributed to approximately 7,000 persons.

Meetings have been held from time to time, in the Transvaal and other parts of the Union, which included meetings for nurses and midwives at Johannesburg; meetings for the public at Johannesburg and elsewhere, and exhibits at the agricultural shows at Johannesburg and Pretoria.

Articles, dealing with the incidence of cancer, prepared by members of the association have been published in newspapers throughout the Union from time to time.

With the object of obtaining accurate statistics of cancer in the Union, a questionnaire in simple form was prepared and distributed during 1934 to some 2,500 medical practitioners in the Union and native territories. A similar distribution has taken place this

year. With the assistance of the Government, a register has been prepared which will be of inestimable value to the Union in keeping proper records of cancer cases in the Union.

The association has become affiliated with the British Empire Cancer Campaign in England.

An artistic poster has been prepared. It was first shown at the Pretoria Health Week Exhibition.

As will be gathered from the foregoing, the association has confined its efforts to educating and securing the intelligent co-operation of the public and directing their attention to the urgent necessity for the treatment of the disease in its early stages.

South Africa, with its many races and varying climatic conditions, presents unique facilities for studying the prevalence of cancer in respect of climatic, racial, environmental, dietetic, and other factors, studies which might lead to important findings in respect of the prevention of cancer.

Experimental investigation of the causation of cancer, however, is being conducted in many centres in different parts of the world, and for such an investigation to be truly representative and of value to the State, large sums of money are required in connection with this organisation. Although certain aspects of such research are to-day being conducted at the South African Institute for Medical Research and Onderstepoort, the Department agrees with the view of the association that the time is not opportune to embark on an expensive institute, whose object it should be to elucidate and understand the causation of cancer.

It is hoped, however, that the association will, in the near future, be able to extend its activities and undertake more active steps to bring into effect some of its aims in order that the public may feel that there is some aspect of the organisation which would be of material benefit to South Africa. Propaganda work in respect of cancer is extremely difficult, mainly due to the fact that it causes the public great ill-feeling and discomfort, and out of fear the question and its importance are shelved. The time has arrived at least when it is not only opportune but proper that a cancer block should be provided in each of the large teaching hospitals. At such hospitals it would be possible to provide teams of specialists who could arrive at accurate and early diagnosis and carry out treatment efficiently and scientifically. The various types of cancer could be studied as regards microscopical, biochemical and biophysical peculiarities. The organisation for diagnosis could furthermore be intimately associated and connected with a system of follow up of cases treated and diagnosed.

The individual practitioner, however conscientious and painstaking he may be, is not in a position to fulfil all that is required for the successful treatment of cancer. The equipment essential for efficient treatment can only be provided at great cost at the teaching hospitals where all modern methods of diagnosis can be placed at the disposal of a team of specialists who would undertake treatment on the most modern lines. The Union is, in respect of cancer organisation, considerably behind most of the civilised countries (including new countries like Australia and the Argentine), and owing to insufficient organisation for the early detection, early diagnosis and early adequate treatment, cancer in South Africa is frequently allowed to pass the curable stage. These two aspects, namely, diagnosis and treatment, alone seem to justify the establishment of special accommodation at the two teaching hospitals.

The association, which appears to be aiming at the establishment of a single institute, has already consulted the Johannesburg Hospital Board for the establishment of an institute in connection with the Johannesburg Hospital. Subject to the board being safeguarded against any additional expenditure in connection with the institute, the Johannesburg Hospital Board has welcomed the suggestion for the establishment of a nucleus of a cancer institute within the precincts of the hospital. The board adds that it does not foresee that any additional cost will be incurred in treating these patients at present, but it does foresee that in time, as it is the intention of the association that the institute should introduce a system to follow up cases and to keep records for statistical purposes, it will necessitate an increase in staff and equipment which will involve additional expenditure, and for this additional expenditure the board cannot accept responsibility. In regard to patients coming to the hospital from outside Provinces, the board welcomes the admission of such cases to the institute, provided the Provincial Government responsible is prepared to meet the expense. It further has indicated that it is prepared to grant the ground for the purpose of the institute within the precincts of the hospital, so that no money need be expended on the acquisition of a site.

Radium in the Union.—The following table indicates the amount of radium held in various parts of the Union by institutions or private medical practitioners:—

TABLE T.—QUANTITIES OF RADIUM STOCKED IN THE UNION.

Name of Institution or Body.	Amount of Radium on Hand.
Pretoria Hospital	Nil.
Kimberley Hospital	121 mgm.
East London Hospital	Nil.
Johannesburg Hospital	1,068 mgm.
Cape Hospital Board	757·32 (element) mgm.
Port Elizabth Hospital	275 mgm.
The Natal Radium Trust	1,132·13 mgm. (860·11 mg. at Addington; 272·02 at Grey's, Pietermaritzburg).
National Hospital, Bloemfontein	300 mgm.
Held by private praetitioners	413 mgm.

16. *Agricultural Use of Arsenic.*—In the last annual report attention was drawn to the possibility of poisoning occurring in human beings and stock as the result of the extensive use of arsenite of soda in the destruction of locusts. It is understood that the Department of Agriculture is still carrying on research work in this important subject. During the year several cases of arsenical poisoning came to the notice of the professional officers of the Department. The lesions chiefly noticed were arsenical dermatitis of the face, hands, legs and scrotum due to the direct contact with the sodium arsenite. The lesions about the scrotum were stated to be due to the spray pumps leaking about knee level and thus spraying the individual working the pump in that region. The preventive measures adopted were to smear the exposed parts with grease and the wearing of an apron to protect the scrotum. Several hospital staffs were called upon to treat cases of arsenical poison in humans due to the use of locust tins as water containers. The District Surgeon, Hopetown, reported having attended four cases of arsenical poisoning in native children, three of whom died. These children were poisoned by eating the sweetened poison that was left in discarded empty tins. It is not always easy to diagnose a case of arsenical poisoning from the clinical symptoms and it is quite likely that more cases of arsenical poisoning occurred than came to the notice of the Department. The district surgeon mentioned above also reported that practically all farmers in the Hopetown District who used arsenical sprays for the destruction of locusts lost stock sooner or later.

It is therefore not inopportune to again draw attention to the dangers involved in the use of arsenical spraying for locust destruction and to the necessity for further experiments into ways and means of safeguarding humans and stock from this poison.

VII.—CONCLUSION.

Colonel P. G. Stock, C.B., C.B.E., of the staff of the Ministry of Health, Whitehall, has continued to act as the official representative of the Union Government on the International Health Office at Paris and as the unofficial liaison officer of the Department with the Minister of Health in London. His services during the year have been much appreciated by the Department and its thanks are due not only to him but to the Ministry which has kindly permitted his activities on behalf of the Union.

The Department has, as usual, again drawn freely during the year on the resources of the South African Institute for Medical Research which the Director has always placed at its disposal. The thanks of the Department are again due to the Board of the Institute and to the Director and staff for their every ready co-operation and assistance in connection with all questions affecting the public welfare.

The South African Medical Council and the South African Pharmacy Board have continued to render material assistance to the Department and my thanks are due to the presidents and members of those bodies and to Mr. E. Herbert, the Registrar, for the manner in which they have co-operated with the Department. Résumés of the work done during the year by these two bodies appear in Annexures F and G.

The Federal Council and the various branch councils of the Medical Association of South Africa have been helpful to the Department in a number of ways during the year. The policy of the Department is to encourage its professional officers to be active members of the Association and, as far as possible, to induce local authorities to consult freely with the local branches of the Association on matters affecting the medical profession.

Nor can I omit reference to the assistance received from Dr. P. J. du Toit and Dr. G. de Kock, the Director and Deputy-Director of Veterinary Services, respectively, and from Dr. Sinclair, the Chief of the Division of Chemistry in the Department of Agriculture. These officers on every occasion on which their advice has been sought have freely placed their services at our disposal.

Municipal medical officers of health have co-operated freely with the Department, and I am greatly indebted to these officials for their kindly help and assistance which has been at our disposal whenever requested.

During the year a number of complaints by members of the public against district surgeons have been investigated. The majority of these have been due to misunderstandings on the part of the public in regard to the nature of the contracts of service and not to infringements of the terms of service.

The year has been one of exceptional strain on all officers in the Department, and I cannot conclude this report without a reference to the extent of the services rendered in the public service by the officers of the Department—professional, clerical and lay. It is certain that were it not for the ungrudging spirit in which every man and woman in the Department works and voluntarily performs duties, often after office hours, many of which do not fall properly to his or her share, the Department could not cope with its growing responsibilities.

Lastly, I have again to record my indebtedness to Dr. E. H. Cluver, who has been responsible for much of the labour involved in the preparation of this report.

I have the honour to be,

Sir,

Your obedient servant,

E. N. THORNTON,

Secretary for Public Health and Chief Health Officer for the Union.

Department of Public Health,
Pretoria, 15th October, 1935.

ANNEXURE A.

CHART OF DEPARTMENT OF PUBLIC HEALTH *as at 30th June*, 1935.

Minister (Chairman.)
Secretary and Chie Health Officer(Deputy Chairman).
Director of Veterinary Services.
Mrs. S. B. Broers.
Messrs. W. J. O'Brien, M.P., and L. C. Serrurier.
Drs. K. Bremer, M.P., A. J. Orenstein, C. P. Theron, and Sir Speneer Lister.

Minister of Public Health (HON. J. H. HOFMEYR).

Council of Public Health

Leprosy Advisory Committee: Secretary and Chief Health Officer (Chairman); Sir Spencer Lister; Professors A. W. Falconer aud W. H. Craib; Drs. A. Pijper, F. C. Willmot, G. W. Robertson A. J. Orenstein, K. Bremer, M.P., and G. Park Ross.

Secretary and Chief Health Officer (Sir E. N. Thornton).

1 Senior Assistant Health Officer (Dr. E. H. Cluver).†

Under Secretary (A. DE V. BRUNT).

Departmental Chief Clerk (A. Stuart).

1 Accouutant (L. J. Hatch).

1 Chief Clerk Gr. II. (R. S. Gordon),

2 Principal Clerks. P. I. Phelan and N. A. G. Reeler).

3 Senior Clerks.
35 Clerks, Typists, etc.

Sections.

Assistant Health Officers (Detached).	Inspection and Field Staff.	Maternity and Child Welfare.	Pathological and Biological Control Laboratories.	Port Health Officers.	District Surgeons.	Housing.	Leprosy Institutions.	Venereal Diseases Hospitals.	Malaria.	Tuberculosis.	Epidemic and Infectious Diseases (Plague, Typhus, Smallpox, etc.), and Vaccination.	Food and Drugs Adulteration; Habit-forming Drugs.	Local Authorities.	Other Bodies.
Capetown: (Drs. F. C. Willmot and P. Allan). Durban: (Dr. G. A. Park Ross and Dr. F. W. P. Cluver). Johannesburg: (Dr. L. Fourie).	Three Assistant Health Officers: (Drs. E. H. Cluver, A. J. van der Spuy, and H. S. Gear) Five Inspectors (4 plague and 1 typhus).	Medical Inspector (Dr. E. Drennan). Nurse Lecturers.	Capetown, and Vaccine Institute, Rosebank: (Drs. W. F. Rhodes, R. Turner C. A. M. Murray). Capetown Biological Coutrol Laboraroty: (Dr. M. H. Finlayson). Durban: (Dr. B. Sampson). *South African Institute for Medical Research, Johannesburg.	Capetown: (Dr. J. M. Bosman). Durban: (Dr. G. A. Batchelor). Port Elizabeth: (Dr. H. W. A. Kay). East London: (Dr. R. V. S. Stevenson). Simonstown: (Dr. A. B. Bull). Knysna: (Dr. J. D. Allen). Mossel Bay: (Dr. F. T. Waldron). Port St. Johns: (Dr. G. H. Meiring).	14 Whole-time. 3 Whole-time. (jointly). 331 Part-time. 348 Total.	Central Board—Mr. R. S. Gordon (Chairman), Sir J. G. van Boeschoten, Messrs. F. W. Jameson and J. L. Hall.	Pretoria: (Drs. J. J. du Pré le Roux, H. v. R. Mostert. H. J. F. Wood, aud J. C. Coetzee). Emjanyana: (J. A. Macdonald, and Dr. A. R. Davison). Mkambati: (H. C. Bellew and Dr. F. S. Drewe). Amatikulu: (F. J. Roach and Dr. G. D. Stoute). Bochem: (J. H. Franz and Dr. P. B. v. d. Lith).	Rietfontein, Johannesburg: (Dr. J. Daneel). Kingwilliamstown *Bochem. *Elim. *Jane Furse Memorial. Several smaller hospitals.	Transvaal: Medical Inspector: (Dr. D. H. S. Annecke). Inspectors and Assistants. Natal: Medical Officer. (Dr. A. L. Ferguson). Inspectors.	Nelspoort Sanatorium: (Drs. B. A. Dormer and H. Ackermann). *Holy Cross Medical Mission.	Field Staff. District Surgeons. Local Authorities. Magistrates, etc.	Inspectors, Customs, Police, etc. Chemical work done in chemical laboratories of Department of Agriculture at Capetown & Johannesburg.	231 Municipalities. 98 Village Management Boards. 38 Local Boards. 30 Village Councils 58 Health Committees. 8 Local Administration and Health Boards. 94 Divisional Councils. 1 Health Board. 154 Magistrates. 5 Mining Commissioners. 717 Total.	South African Medical Council, South African Pharmacy Board. Rand Water Board.

* Receives Grant-in-Aid. † Is also Director of Medical Services (Defence).

ANNEXURE B.

Pamphlets and Leaflets published by Department of Public Health :—

"Senecio Disease." (Warning Notice.) No. 166 (Health).
"Food and Health." No. 194 (Health).
"Anthrax." No. 239 (Health).
"Venereal Diseases: Their Prevention and Treatment." No. 248 (Health).
"Instructions to Persons suffering from Gonorrhoea." No. 249 (Health).
"Instructions to Persons suffering from Syphilis." No. 250 (Health).
"Instructions to Native Patients suffering from Syphilis or Gonorrhoea." (In Zulu, Sixosa, Sesuto and Sechuana.) No. 358 (Health).
"Poisoning by 'Stinkblaar' or Thorn Apple *Datura stramonium* and *Datura tatula*)." (Warning Notice.) No. 256 (Health).
"Smallpox: Duties and Powers of Local Authorities under Public Health Act, and procedure to be followed in dealing with outbreaks." No. 276 (Health).
"Directions for the Performance of Public Vaccination," No. 279 (Health).
"Dagga Smoking and its Evils." No. 289 (Health).
"Plague: A Brief Account of its Symptoms, Clinical Diagnosis, Morbid Anatomy and Treatment." (Drs. D. C. Rees and J. A. Mitchell.) No. 293 (Health).
"Plague: Its Control, Eradication and Prevention." No. 316 (Health).
"Plague Prevention and Rodent Destruction." No. 317 (Health).
"Plague Danger in Cape and South-Western Districts: Measures and Procedure in Event of Outbreak." No. 380 (Health).
"Rodents: Description, Habits, and Methods of Destruction." (W. Powell.) No. 321 (Health).
"Fly-proof Latrines for Coloured Persons." (Dr. G. A. Park Ross.) No. 334 (Health).
"Houseflies: Their Life-history, Destruction and Prevention, and their Influence on Health." No. 335 (Health).
"Bilharzia (Human Redwater) Disease." No. 339 (Health).
"Snake-bite and its Treatment." No. 348 (Health).
"Influenza." No. 363 (Health).
"Typhoid or Enteric Fever: Its Causes, Spread and Prevention in South Africa." No. 365 (Health).
"Catechism about Typhoid or Enteric Fever." No. 378 (Health).
"Care of the Teeth and Prevention of Dental Disease in Children." No. 368 (Health).
"The Teeth: How to Prevent Decay." No. 379 (Health).
"Leprosy in the Transkei." No. 372 (Health).
"The Cause and Prevention of Simple Goitre." No. 394 (Health).
"Typhus or Louse Fever." No. 417 (Health).
"Typhus Catechism." (In Zulu, Sixosa, Sesuto and Sechuana.) No. 488 (Health).
"Consumption, its Causes, Prevention and Treatment." No. 439 (Health).
"Malaria Catechism for use in Schools." No. 360 (Health).
"Life History of the Malaria Parasite." No. 464 (Health).
"Directions for the Prevention and Treatment of Malaria and Blackwater Fever." No. 198 (Health).
"Malaria Control by Anti-Mosquito (Adult) Measures." No. 465 (Health).
"The Control of Malaria by Larvicidal Methods." No. 435 (Health).
"Truths about Cancer." (Published jointly with the National Cancer Association of South Africa.) No. 473 (Health).
"Rabies." (Published jointly with the Director of Veterinary Services, Department of Agriculture and Forestry.) No. 501 (Health).

ANNEXURE C.

TABLE 1.—PORTS OF THE UNION: HEALTH MEASURES DURING THE YEAR ENDED 30TH JUNE, 1935.

Particulars.	Capetown.	Durban.	Port Elizabeth.	East London.	Mossel Bay.	Knysna.	Port St. Johns.	Simonstown.	Port Nolloth.	Total.
Vessels dealt with	1,112	1,559	808	640	218	11	18	69	54	4,489
Cases of infectious or communicable diseases dealt with	330	148	2	—	—	—	—	—	—	480
No. of Vessels involved	85	82	2	—	—	—	—	—	—	169
Disinfections—										
Vessels	21	6	2	—	—	—	—	—	—	29
Consignments of second-hand clothing and other articles	2	13*	4	—	—	—	—	—	—	19
Deratizations under International Sanitary Convention—										
No. of Vessels Deratized and Certificates Issued	1	64	—	—	—	—	—	—	—	65
No. of Exemption Certificates Issued	14	29	—	—	—	—	—	—	—	43
Rats Destroyed on Vessels and in Dock Area	2,299	1,334	1,335	685	984	—	—	—	—	6,637

* In addition, the personal effects of 1,725 Indian passengers were disinfected.

ANNEXURE D.

ANNUAL REPORT OF THE SOUTH AFRICAN RAILWAYS AND HARBOURS HEALTH ORGANISATION, 1934-1935.

By Dr. C. G. Booker, *Assistant Health Officer for the Union.*

ORGANISATION.

During the period under review very considerable progress has been made in the organisation and training of the staff connected with health work. Up to as recently as two years ago the organisation consisted of a few semi-trained men confined to anti-malaria work on sub-tropical sections who, under expert supervision, were gradually being introduced into the more essential phases of public health work. The larger body of men employed entirely on rodent destruction did not concern themselves with matters relating to hygiene. They worked without medical direction and in fact made no contact with the developing health organisation.

The policy of combining the two units under qualified supervision and of training the whole staff in other matters pertaining to public health has given the organisation a tremendous impetus forward and was directly responsible for the recruitment of a much better type of person. This policy was first tried in Natal and in the Eastern Transvaal. The success on these two systems was so encouraging that it was decided to reorganise on a similar footing in the Orange Free State where plague and typhus constituted a serious menace. In view of the numerous and extensive outbreaks of these two diseases this year, this step appears to have been taken at a very opportune time.

The appointment of an inspector in the Orange Free State has enabled not only plague and typhus to be handled successfully, but also for domestic water supplies, sanitation and other health matters in that province to be dealt with more adequately. As the Cape Northern section is situated conveniently to the Orange Free State and as the main health problems on the two systems are akin, it is proposed to include the former under the supervision of the latter in the near future. Besides economy in the disposition of staff, this proposal will make for greater efficiency in working especially in times of epidemics.

Sufficiently experienced staff has not been available to bring the closer organisation of the coastal systems in the Cape Province into complete effect. One inspector is now available and it is proposed to make an appointment at Capetown in the near future.

As railway hygiene has its own peculiar problems, it was early decided that vacancies in the higher grades would only be filled by men in the employ of the Administration and trained in its own health service. Although this development policy has the disadvantage of being slow in progress, it has many other points in its favour and has been adhered to without exception. It is gratifying to observe how eagerly the young men have qualified for the work. During the year four men qualified and were promoted to assume partial supervisory duties and some fifteen men are receiving instructions with a view to taking the Royal Sanitary Institute Certificate.

Recruiting and Training of Staff.—An arrangement exists with the Defence authorities whereby members of picked volunteers in the ranks of the Special Service Battalion are given an intensive three months' course of training in general sanitation, domestic water supplies, fumigation, public health legislation and the control of malaria, plague, typhus and other infectious diseases.

At the completion of the course the number of candidates for whom vacancies exist is selected by competitive examination and given probationary employment as learners under strict supervision on various sections. During this period the men are tutored in the practical aspects of their work. Their sections are regularly visited and they are guided in the methods to be adopted. After a year's service, and before being passed out as sanitary foreman, each candidate is again examined. On the result of this examination and his past adaptability a decision is taken as to what phase of health work he is best competent to perform. If at this stage he is not likely to prove a success he is given other railway duties.

During this year six successful candidates from one of these training classes were drafted into plague areas and proved very useful in this emergency.

Other desirable candidates from the class are absorbed into other branches of railway work and act as a reserve in the event of other vacancies occurring. The organisation itself carries no reserve staff and only when a vacancy occurs is a new appointment made.

The difficulty of selecting individuals from the ranks of European labourers and of training them in their multifarious duties is so great that this course is adopted only in exceptional cases.

Supplementary Training.—The above instruction is being augmented by study during the evening hours. In order to promote this, pamphlets have been issued by this office on the major subjects, e.g. plague and rodent control, malaria, typhus and fumigating, the first mentioned alone consisting of some 50,000 words. Other courses of instruction will follow. The opportunity for gaining knowledge in this manner counteracts to some extent the disadvantage suffered by the Railway field staff in not being able to make regular attendance at a technical college.

The latter difficulty was recently represented to the governing body of the Royal Sanitary Institute and it was asked to recognise the duties of railway sanitary foremen as being equivalent to those of the same type of employee in the service of local authorities for whom provision already exists as regards qualifying for the examination. I am pleased to be able to record that after full consideration the Institute has agreed to allow Railway health servants of a required standard to enter for the examination. The decision has removed a stumbling block for those of our men who were stationed away from training centres and were accordingly unable to qualify.

This advantage has been followed up by the inauguration of correspondence training classes in preparation for the Royal Sanitary Institute Certificate. Theoretical knowledge will be supplemented by a few days' intensive instruction at a large centre when the most modern practice in regard to the handling of food and milk, water supply and storage, disposal of sewage and rubbish and precautions in infectious diseases, will be demonstrated.

The whole scheme aims at developing the best in the material available.

Grading of Staff.—A comprehensive system of regrading for the various grades of staff was put forward to the management and approved without amendment. The scheme provides for the gradual advancement from the learner stage in which the youth joins the work and passes through two grades of sanitary foreman to the position of sanitary inspector—a salaried post obtained after proficiency has been reached. The highest grade is that of health inspector intended for an officer in charge of the health matters in a province.

A special grade—that of rodent foreman—was formed for which there was only one vacancy in the Union. This position was created out of a necessity for the appointment of an expert in rodent work to make surveys throughout the Union, checking up the work of the field staff and giving expert advice to artisans employed on rodent proofing.

Railway Medical Service.—According to the present legislation, unoccupied Railway property and even premises occupied in an official capacity by the Department, are withdrawn from the purview of the local authority and its medical officer of health. Although the Minister of Public Health is the local authority on such property, we were, in the past, in the anomalous position that such premises were without a medical officer of health other than the District Surgeon.

During the year the Railway medical officers agreed to become *ex officio* medical officers of health on the sections under their control. This is a tremendous step forward and now that this stage is reached, every effort will be made to co-ordinate the work of the Railway health staff with that of the Railway medical service.

Relation to the Union Health Department.—Although insanitary conditions on property adjoining railway premises could severely affect the health of the Administration's staff, the Railway health staff in the past, had no authority on such property other than to inspect and to report to the local authorities or the Union Health Department. This decided weakness was removed during the year by appointing the Administration's health officer an assistant health officer to the Union Health Department. By virtue of this arrangement there is an intimate co-operation between the two departments and the Railway health staff is now empowered to approach adjoining owners directly in regard to adverse conditions and to advise them as to the proper steps to be taken to correct defects affecting railways. Failing correction the matter is reported to the Union Health Department for prosecution, but to prevent ill-feeling, the policy adopted is to settle matters amicably as far as possible. The fact that no prosecutions have been advised by this staff speaks well for the tact with which these difficult problems have been handled.

During the year fifty-four authorities were issued by this office enabling their holders to enter and carry out inspections on adjacent private property in relation to plague, malaria and other matters detrimental to the Administration's interests.

Relation of Railway Health Staff to other Health Authorities.—The relationship between the Administration's health staff and that of local authorities has been one of amity throughout the year and co-operation has been well maintained everywhere. These relations and the notable improvement in the work done by most local authorities have contributed materially to the success of the year's work.

Although the Railway health staff worked side by side with that of most local authorities, various forms of co-operation were arranged during the year. Examples of these are as follows:—

(*a*) At Pietermaritzburg, Verulam, etc., material was contributed by the Administration in return for labour on railway premises.
(*b*) At Empangeni, Mandini, etc., material was contributed by the local authority in return for labour outside railway premises.
(*c*) At Zeerust, Klerksdorp, etc., labour was granted by the Administration in an emergency and returned in times of normal conditions.
(*d*) At Aliwal North, Kaapmuiden, etc., the Administration was reimbursed for work performed outside railway property.
(*e*) At remote stations such as Komatipoort and Gollel where no local authority existed or where the interest was mainly railway, all the work was performed by the Administration.

In addition to local authorities, co-operation was also extended to other Administrations and Government Departments.

During the year a member of the Raliway health staff was seconded to the South West Administration for a period of seven weeks to tide over during an emergency.

The Railway Department was also approached by the Bechuanaland Protectorate Administration with a view to co-operating in that territory. This was arranged.

During the present plague outbreak the Railway health staff co-operated actively with the Union Health Department in preventing the spread of the disease by rail, and in stamping out some foci.

At the request and at the expense of the Native Affairs Department, the Railway health staff undertook malaria control outside railway premises at Letaba where the proximity of the natives constituted a menace to the health of railway employees.

Disposition of Staff.—The 13,000 miles of Union and South West African railway embracing some 1,200 stations is divided into 33 sections which are covered by staff as shown in the table below. They average approximately 360 miles in length, each with an average of 33 stations, but the length varies with the local conditions and is shorter in malaria and troublesome rodent areas, more particularly in populous districts.

THE NUMBER AND DISPOSITION OF VARIOUS GRADES OF STAFF UNDER THE CONTROL OF THE SOUTH AFRICAN RAILWAYS AND HARBOURS HEALTH ORGANISATION.

	Natal.	Eastern Transvaal.	Western Transvaal.	Orange Free State.	Cape Northern.	Cape Western.	Cape Midland.	Cape Eastern.	South West Africa.	Total Staff.	Salaries.
Railway Health Officer.....	One for all systems.									1	£1,300
Office Assistant..	,, ,,									1	330
Rodent Foreman.	,, ,,									1	240
Assistant Engineer Drainage Sanitation.....	1	—	—	—	—	—	—	—	—	1	500
Health Inspector.	—	1	—	—	—	—	—	—	—	1	360
Sanitary Inspector	1	—	—	1	—	—	—	—	—	2	600
Sanitary Foreman Grade I.....	4	3	—	—	—	—	—	—	—	7	1,400
Sanitary Foreman Grade II.....	4	—	—	1	—	—	—	—	—	5	850
Learner Sanitary Foreman.....	—	2	1	2	1	2	1*	1*	1*	11	1,512
Ratcatchers.....	—	—	3	3	1	3	1	1	1	13	2,600
Non - European Labourers.....	50	25	3	6	2	3	2	2	2	95	2,850
TOTAL.....	60	31	7	13	4	8	4	4	4	138	£12,542

* These three men will be available as soon as the plague position is easier.

In addition to the above staff most systems have one or more camp overseers, some of whom are graded as sanitary inspectors or sanitary foremen and attend to local health work. There are also 13 full-time fumigators, costing approximately £3,276 per annum, and some 42 other artisans partly employed on fumigation work. Most of these men work under the directions of the health organisation, but they have not yet been completely absorbed by it.

Patrol of Sections.—All stations and cottages and sections under control are visited at intervals which depend on local conditions. In malaria areas a weekly visit is essential, in badly rodent infested areas a monthly visit is necessary, and in districts where sanitation is the main feature a quarterly visit is usually sufficient, but special inspections are made as occasion demands.

MALARIA.

In Natal there are eight organised malaria sections extending throughout the coastal belt from Port Shepstone to Gollel and along the main line as far as Ladysmith. In the Transvaal there are four sections and the campaign extends from Waterval Boven to Komatipoort and along the Selati to Beit Bridge. Particulars in regard to stations and population protected are shown in the table below:—

PARTICULARS OF CONTROLLED SECTIONS.

	Natal.	Transvaal.	Total.
Miles of line protected	582	704	1,286
Number of stations protected	100	32	132
Number of gangers' cottages protected	18	39	57
Number of houses protected	653	263	916
Number of barracks protected	174	201	375
Number of European staff protected	830	733	1,563
Number of European dependents protected	2,288	2,059	4,347
Number of native employees protected	1,446	1,175	2,621

In view of the selectiveness of the breeding habits of the two mosquito vectors in the Union, *A. gambiae* and *A. funestus*, the policy adopted was species sanitation combined with an intensive system of quinine and plasmoquin treatment, on the lines suggested by Sinton, after the diagnosis had been confirmed by thick blood smears. As a result of this treatment the relapse rate has diminished to 5 per cent., except at Komatipoort where it has again risen to 45 per cent. as a result of other forms of treatment.

The policy may be briefly summarised under the following headings:—

(A) *Destruction or eradication of vectors by permanent methods.*

(i) Draining.
(ii) Reclamation.
(iii) Absorption by tree planting.
(iv) Partial shading out of breeding by tree planting.
(v) Fencing to restore vegetation and shade and prevent cattle entering and making hoofprints.

(B) *Destruction of vectors by temporary methods.*

(i) Larvicides, such as oil and Paris Green.
(ii) Insecticides (pyagra and paraffin mixture).

(C) *Separation of the susceptible host from the infective vector.*

(i) Efficient gauzing.
(ii) Selection of new housing sites away from breeding places.
(iii) Separation of carriers from susceptible population.

(D) *Propaganda work.*

(i) Advocating the use of bed nets where they are warranted.
(ii) Advocating anti-mosquito measures by individuals in the home.
(iii) Explanation of the grave risk of malaria and how the menace is best mitigated.

(E) *Medical.*

(i) Clinical diagnosis supported by laboratory examination of thick blood smears.
(ii) Prevention of relapses by systematic treatment.
(iii) Adequate distribution of reserve supply of drugs in case of need.

Anopheline Surveys.—A regular search was kept up on a half-mile basis throughout the malaria season. All potential breeding places were located and marked. A careful search for adult mosquitoes was simultaneously

made. All larvae and adults taken were identified, recorded and reported at weekly intervals. The following table shows the activity of the field staff in this direction:—

ANOPHELINE FINDINGS BY THE FIELD STAFF, 1934-1935.

	Gambiae and *Funestus*.		Other Species.	
	Larvae.	Adults.	Larvae.	Adults.
1934:				
November	95	43	584	10
December	116	111	466	27
1935:				
January	185	100	664	135
February	413	255	1,027	85
March	247	74	1,504	76
April	338	18	1,070	62
May	19	2	137	13
TOTAL	1,413	603	5,352	412

Control Measures.—As soon as vectors made their appearance in any district all potential breeding places within the radius under survey were treated at weekly intervals with anti-malaria oil, or, in the case of water used for industrial, irrigation or domestic purposes with Paris Green, and this was continued for the rest of the season. Where the slightest doubt existed as to the effectiveness of larvae control, this measure was supplemented by spraying all huts and houses within the complex with pyagra 1:20 and continued at weekly intervals or more often if circumstances demanded it until a negative *A. gambiae* return was obtained. Where larval control was efficient within the specified radius and vectors continued to appear, anti-larval operations were extended. It became necessary to adopt this extended control at Komatipoort, Letaba and Tzaneen this year.

The total amount of anti-malaria oil used during the year was 27,688 gallons. This represents a saving of 6,334 gallons over the previous year.

Screening of Quarters.—The Administration's policy is to confine screening to quarters and office accommodation in climatic areas, but during the past two years this benefit has been extended to other stations where the intensity of malaria is great—each station being treated on its own merits. Most stations on the North Coast of Natal have now been included in this programme with great benefit to the staff.

In the Eastern Transvaal 163 houses have been screened, and in Natal 163 houses and 33 barracks have had similar attention.

The gauzing of the Administration's buildings in malaria areas is a model of perfection and continues to be maintained at a high standard of efficiency. It is regularly inspected by the anti-malaria staff and its condition recorded on cards kept in the houses and specially provided for the purpose.

Minor defects are reported to and repaired by residents. Major defects are reported to and repaired by the Works Inspector's staff.

The gauze used at the coast is Monel Metal with ·0508 in. aperture sq., and 16 wires to the linear inch 30 S.W.G. In the Transvaal bronze gauze is preferred.

Permanent Measures.—In winter when mosquito breeding is suspended and malaria is in temporary abeyance, the regular patrol of sections is not warranted. Longer sections are then allocated and permanent anti-malaria measures and other health duties such as rodent control, domestic water supplies and station sanitation concentrated on.

The permanent anti-malaria work consists of dealing with actual breeding places previously located, each place being dealt with on its own merits. The measures adopted were decided by the Assistant Engineer (Drainage and Sanitation) in Natal and the work was carried out under the supervision of the field staff by the regular anti-malaria gangs assisted by casual labour in major operations.

The nature and the amount of work carried out during the year is shown in the table below.

PERMANENT ANTI-MALARIA MEASURES.

	Natal.	Transvaal.	Total.
Subsoil drains	1,796 yards	2,966 yards	4,762 yards
Concrete drains	50 ,,	50 ,,	100 ,,
Earth drains	2,378 ,,	10,773 ,,	13,151 ,,
Stone drains	9 ,,	50 ,,	59 ,,
Surface drains cleared ...	1,700 ,,	10,000 ,,	11,700 ,,
Borrow pits filled in ...	170 ,,	205 ,,	375 ,,
Trees planted...	2,953 ,,	2,500 ,,	5,453 ,,

Other Works.—At Komatipoort a squad ganger with a gang of 12 natives occupied with the levelling of the river bank in order to do away with the numerous depressions and side streams, shifted 4,416 cubic yards of sand and 3,052 cubic yards of stone. Up to date 800 yards of the bank has been levelled. This work has been instrumental in confining the water to the main stream and preventing collections of water on the completed stretch, after floods.

Malaria Incidence.—It is gratifying to report that the malaria incidence has again dropped very considerably during the period under review. This is accounted for by the improved organisation, the greater experience of the field staff and the higher standard of work performed by the outside authorities, as well as the increased co-operation of the railway population and the reduction of relapses and carriers by intensive treatment.

The progressive reduction of malaria incidence during the three years that the organisation has been in existence is shewn in the figures below. These figures calculated in terms of 1,000 of the population at risk in Natal, compare very favourably with the incidence in controlled areas in other parts of the world.

MALARIA INCIDENCE PER 1,000 YEAR ENDING 31ST MAY.

1933	1934	1935
111·0	25·1	13·6

Malaria incidence: anopheline catches and meteorological factors.—The main factors influencing malaria control in the field are rainfall, temperature and humidity.

The relation of the first two of these factors to the prevalence of vectors and to the incidence of malaria is given in the table below, all the items of which refer only to the North and South Coasts of Natal.

RELATION OF MALARIA INCIDENCE TO ANOPHELINE CATCHES AND METEOROLOGICAL FACTORS.

Month.	Rainfall.	Mean Temperature.	*A. gambiae.*		Malaria N. and S. Coast.
			Larvae.	Adults.	
1934:					
June	1·52	65·4	—	1	9
July	4·79	62·3	—	—	3
August	1·88	66·6	—	—	3
September	0·93	67·5	—	—	—
October	1·91	69·8	8	15	1
November	2·95	72·5	48	40	—
December	8·15	73·9	43	13	2
1935:					
January	3·77	74·7	95	13	1
February	4·91	74·2	183	2	2
March	5·58	71·9	115	—	2
April	2·50	70·4	113	—	1
May	6·90	66·3	12	—	1

When these figures are plotted out graphically it becomes evident that the malaria incidence no longer follows the fluctuations of rainfall as happened prior to 1933, and, that control has been effectively maintained in spite of the continuous rains and favourable temperature (70° and over). This is borne out by the low adult catches, especially at a time when breeding was at its height.

The monthly incidence of malaria among employees for Natal and the Transvaal is shewn in the table below. For purposes of comparison the corresponding figures for 1934 are also given. These figures include malaria

is uncontrolled areas and in large centres under the control of local authorities where the Railway health service cannot fully protect the employees.

TOTAL MONTHLY INCIDENCE OF MALARIA AMONG RAILWAY EMPLOYEES DURING THE 1934 AND 1935 SEASONS.

	South Coast.		North Coast.		Rest of Natal.		Eastern Transvaal.		Total Malaria.	
	1934.	1935.	1934.	1935.	1934.	1935.	1934.	1935.	1934.	1935.
January	—	—	1	1	7	4	13	5	21	11
February	—	—	3	2	6	4	19	8	27	14
March	—	1	6	1	8	2	14	11	28	15
April	—	—	9	1	17	2	8	8	33	11
May	—	—	5	—	26	3	5	1	25	4
June	—	—	9	—	20	—	2	—	39	—
July	—	—	5	—	22	—	6	—	21	—
August	—	—	3	—	4	—	3	—	10	—
September	—	—	—	—	5	—	2	—	7	—
October	—	—	1	—	4	—	1	—	6	—
November	—	—	—	—	4	—	2	—	6	—
December	—	—	2	—	4	—	5	—	11	—

The higher incidence for the "Rest of Natal" is due to a larger population at risk and not to a higher malaria incidence. This is borne out by the fact that vectors were not detected inland.

Much of the malaria shewn is due to relapses. It will be observed that malaria has completely disappeared from the South Coast and that the North Coast is no longer the dreaded area it once was.

The position in the Transvaal is capable of further improvement but the higher figures for this province are mainly due to factors beyond the control of the field staff, e.g.:—

(i) Very little malaria control is undertaken other than by the Administration.

(ii) Of the 40 cases reported for the period November, 1934, to May, 1935, the diagnosis was not supported by the result of bloodsmears in 21 cases, and in 14 cases the disease occurred among employees resident in uncontrollable areas.

ANTI-PLAGUE MEASURES.

As indicated earlier in this report, the Administration is aiming at the formation of one combined health unit covering the whole Union from the staff previously engaged upon separate rodent, malaria and fumigation duties. In this, anti-rodent work must figure very largely on all sections as the menace is a general one.

It is not always realised that the *prevention* of infestation rather than dis-infestation is aimed at. This can only be accomplished by a continuous patrol of sections and constant inspection of, and repair to, the rodent proofing of structures.

In all settled communities the rat proofing of sheds, stores, stables, offices and other places where rodents can obtain food, shelter and breeding places is of the greatest importance in a rodent campaign and this policy is steadily being pursued, prior attention being given to grain areas, large centres and ports. This will reap its reward in longer and less troublesome sections, less damage to foods and a diminished risk to life.

During normal periods the Union railway area is split up into approximately 33 sections, each member of the staff having freedom of movement thereover. The first duty of the rodent staff is to be able to assess accurately the nature, extent, and age of infestation in the stations visited. Their knowledge of rodents must be such as to enable them to deverminise skilfully buildings after deciding which method: gassing, trapping or poisoning is likely to succeed. They must make a comprehensive survey of the locality both on and off railway property in order to determine whether private land or premises are responsible for the harbourage of rodents, so that the question may be represented to owners.

This system of patrolled sections is very readily changed to provide for necessities arising out of a plague epidemic. In such an event it is found that far more practical work can be done by discontinuing routine anti-rodent work as such, on all sections in order to provide a greater concentration of field staff to affected areas. Early on in the recent epidemic the Department was approached by one or two of the larger Union municipal organisa-

tions with a request to permanently station a member of its rodent staff at the goods depot to disinfect all merchandise brought by rail from the country districts to prevent possible spread of infection to the large centres in question. It was, however, pointed out that such a policy would involve the Administration in an endless demand for staff over the whole Union and would mean that the problem was being approached from the wrong end. The Administration's policy is briefly as follows:—

Particulars of all human and rodent infections are received from the Union Health Department, Pretoria, and the information is passed on to the railway field staff in the areas concerned. The latter ascertain from the local magistrates particulars of the quarantined areas and a man is immediately sent to the station nearest the point of outbreak to disinfect all outgoing produce from neighbouring areas that might harbour rodents or fleas, and to ensure that railway premises at this point are free of rodents. The main function of the Administration's anti-rodent staff during times of plague infection is to protect the country from the risk of the spread of infection by rail and the measures adopted during the recent year have proved sound and efficient in this respect.

Plague has for many years been endemic among field rodents in certain parts of the Union, chiefly amongst gerbilles in the sandy areas of the Orange Free State. Conditions during the year have been extremely favourable for wholesale rodent infection by reason of the rapid multiplication of the rodent population consequent upon the abundance of seed crops and vegetation after the drought and the absence of epizootics for some considerable time. Following the heavy increase in the rodent population many instances of a "flare up" of infection, in widely separated areas were reported by the field staff indicating that the Union was about to pass through another plague epidemic. It is fortunate that the Department's health staff in the Orange Free State had been recently reorganised chiefly in respect of having independent supervision and was in thorough readiness to cope with the outbreak. Had this not been the case, control of the measures must have been haphazard and the results possibly calamitous. A continual check on the position was maintained by forwarding for examination to the South African Institute for Medical Research, Johannesburg, all rodents found dead where the cause of death was unknown.

Plague first made its appearance in rodents in dangerous proximity to dwellings near Allemans Station on the Orange Free State main line in September. While many colonies of gerbilles died out no human cases occurred in this district until October. The first human cases, however, were reported in the Thaba 'Nchu area about four miles from the station, during October.

Infection in rodents then spread east to Tweespruit and west to Sannaspos. Later on a human case occurred in the former area. This section is an important maize area and at this time our men were continuously employed on it gassing produce trucks until the position was considered safe.

From Allemans, infection reached Brandfort to the north, when in November two human cases were reported in this area. At the same time an outbreak occurred in the Winburg district still further north. The most seriously affected districts, however, were those of Boshof and Jacobsdal, the former being immediately west of the original scene of rodent infection. The railway line between Kimberley and Bloemfontein forms a dividing line between these two districts and owing to the almost continuous nature of human plague incidence in both areas from the rise of infection in January until May when it began to recede, it was necessary to preserve a constant patrol of this line and the stations there over.

Taken as a whole, the epidemic in the Orange Free State from December to May, may be said to centre round the Brandfort district whence it radiated to the neighbouring districts of Bloemfontein in the South, where 23 separate human outbreaks occurred; Thaba 'Nchu to the east, where 8 outbreaks occurred; Boshof, with 23 outbreaks and Jacobsdal with 21, to the east and south-east respectively. These were in the main the most seriously affected areas. As the epidemic reached its height in February and later in April, other and more widely spread areas became affected. Lesser affected areas, where railway rodent staff had nevertheless to disinfect goods at adjoining railheads were Koffiefontein, Bothaville, Hoopstad, Fauresmith, Philippolis, Smithfield, Zastron, Heilbron, Kroonstad, Vredefort, Trompsburg, Rouxville, Clocolan, Lindley and Edenburg, in the Orange Free State. Lady Grey, Glen Grey, Aliwal North and Herschel in the Eastern Cape and more recently at Williston in the North-western Cape. In the Transvaal slight infection broke out near Vereeniging no doubt from the affected area across the Orange Free State borders, but considerable infection occurred to the west in Marico district, which if not endemic to this part seems likely to have gained entrance by veld rodents *via* the North Western Orange Free State and Ventersdorp district, it being in direct line with the points mentioned, where infection had already occurred.

In February the whole section Bloemfontein-Vereeniging became infected, cases occurring near Kroonstad, Glen, Wolvehoek, Dover and Vereeniging. In April it was considered that infection was established throughout the whole of the Orange Free State.

Altogether to the end of May, 1935, there were some 155 separate outbreaks, involving 205 cases with 112 deaths extending over 29 magisterial districts throughout the Orange Free State, Transvaal and Cape Province. Of these, 125 outbreaks occurred in 21 magisterial districts in the Orange Free State alone.

In the Northern Free State some concern was felt over outbreaks occurring near the railway land in the vicinity of which a great deal of rodent mortality had taken place. The latter had been proved to have resulted from plague and owing to the continued lack of co-operation on the part of a local owner in disinfestation work matters began to look desparate. With the cognisance of the Union Health Department and the consent of the owner a dangerous situation was finally averted by the Department undertaking a cyanogas disinfestation of the private premises at the owner's expense. This fortuately was the only case where it was necessary to take extreme action.

Owing to the widespread nature of the infection and the number of foci where infection took place at the same time, it became essential during the early part of the year to call in additional help from other systems to the centres in question. Two of the rodent staff from the Cape Western system and one from Natal were brought in, in addition to six probationer members of the staff who had been undergoing training at Roberts Heights. All were hastily fitted out with plague field equipment and gassing outfits. As well as undertaking railway disinfestation, many minor local authorities unable to keep up an expert rodent staff, were issisted in the preservation of rodent free belts round the village areas. In other instances farmers and small communities were instructed in the requirements of plague control at the request of the Public Health Department. This assistance was given wherever plague cases occurred. In the early stages when the rodent epizootic was accompanied by great activity on the part of field mice and gerbilles, the number of these vermin exterminated by the field staff was appalling. In the smaller settlements around Kimberley the infestation from field rodents on trek was frightful and at Modder River thousands were gassed in one day.

Relationship with municipal and other similar bodies has been most satisfactory. Much needless waste of time was saved by an arrangement with the local authority whereby it undertook to keep railway property free of serious infestation during the plague period after we had assisted them in the original disinfestation and when the outbreak first threatened.

Plague in the Transvaal was confined mainly to the large native country districts in the west. Unfortunately, however, by reason of the native superstition and prejudice to European anti-plague measures in such areas the disease usually obtains a good hold before the civilised community in the neighbourhood become aware of it. A good deal of risk has by that time been run by reason of the frequent travelling of these natives to civilised areas to serve the needs of goods and labour. In the Marico District alone the Administration is vitally interested in the state of the country districts by reason of a considerable network of road moter bus services, and at one time when plague was at its height public confidence in the Administration's ability to prevent the infection gaining access via its bus routes to civilised communities would have been shaken had not a firm line been taken. Railway rodent staff were placed at the bus and rail junctions for disinfestation work and combined with the local bodies staff.

It is pleasing to relate that not one single case of human plague was found upon railway premises or attributed to conveyance by rail. I consider that this success was due to two factors. Firstly, the extensive system of rodent proofing carried out during the past year and, secondly, the efficiency of the field staff and the policy adopted in control measures. Without these factors plague must assuredly have been carried to some of the larger centres of the Union.

Ratproofing, i.e. building the rat out of railway premises, consists of (*a*) making natural harbourages such as guttering, roof ridging, and hollow walls, impossible. Access to these places is prevented by wire netting and sheet iron, every corrugation and space being attended to. Floors where solid, are made of concrete or asphalt, and the outside of foundations are protected with sheets of corrugated iron to a depth of two feet to prevent access from outside. Loading bank facings, heretofore of sleepers or loose rubble are being gradually replaced by concrete and other non-harbouring materials; (*b*) disinfesting artificial harbourage. Stacks of grain and merchandise are disinfested and turned over at regular periods, old records (usually placed in the goods shed or checker's office for convenience) are being kept elsewhere or tidied and made incapable of harbouring rodents.

These measures are very successful. An immediate difference is observed in the infestation of and damage caused in sheds so treated; for whilst minor damage to doors or walls may permit of the ingress of stray rodents, the lack of shelter within causes them to retreat immediately. With infestation at a minimum in the vicinity it follows that the rat must eventually retreat to more distant places of harbourage.

The Department's rodent proofing programme on the various systems may be briefly indicated. Each system has its own peculiarities and demands, and the same progremme does not apply in all parts of the country. A good deal of indifferent work has been done and much money spent when it was realised that the only method of securing entire satisfaction would be to train the men who did this class of work and make them realise that "apparent proofing" would by no means be allowed to pass. Accordingly it was arranged for each system to send a carpenter to the Orange Free State to get first hand experience and training of the methods to be adopted. Actually there is not a great deal of technique to learn in this work, but the golden rule is thoroughness and this is where the greatest need for understanding of the demands of the work lies.

The *Orange Free State* being one of the largest grain areas in the continent and in addition the centre of endemic rodent plague in the Union, the completion of ratproofing has been one of the chief necessities. Great progress has been made during the year and broadly speaking most sheds on the system have now been ratproofed, the only major exception being the line from Bloemfontein to Bethlehem skirting the northern boundary of Basutoland. This line is at present being proofed, considerable progress from Bloemfontein outwards having already been made. Of a total of 112 sheds on the system 79 have been completely proofed and work is in hand on the remaining 33. A total of 99 sheds have cement floors, 8 have asphalt, 4 wood and only 1 is of earth, of the loading banks 75 are constructed of concrete and 37 of sleepers. A large number of privately owned and Co-operative Societies sheds exist on this system very few, if any, of which have been ratproofed. Some 19 of the Co-operative sheds alone are actually situated on railway premises, whilst 29 are on adjacent land with direct access to railway land. The unsatisfactory position arising out of the proximity of these infested sheds cannot be allowed to continue indefinitely and steps will have to be taken to secure the co-operation of owners to a mass improvement.

The *Cape Northern System* lies to the north-west of the Orange Free State and is allied to it from a grain and field rodent aspect. Plague has always trespassed upon this system and again during the year. Some 330 miles of the main line from Capetown to Johannesburg pass through it mostly over the affected area. A great number of the stations on this line have been made rodent proof during the year. Altogether a total of 50 stations all bordering the endemic plague areas have been proofed in this system. A programme for the continuation of proofing mainly in the northern area of the system is in hand. Privately owned sheds are greatly in need of attention.

This system is of international significance by reason of the existence of the main line from the Cape through Bechuanaland to Rhodesia.

In the *Western Transvaal* greatest urgency has been the completion of sheds in plague threatened areas. Work is being carried out in the section between Johannesburg and Vereeniging, Van Reenen, the Orange Free State and from the latter point to Langlaagte. This will assist in preserving the barrier between the Orange Free State and the Reef centres. Portion of the Natal main line from Union Junction to Volksrust has been completed and sheds at the more important stations on the line west to Mafeking have been proofed. Only two sheds on the Langlaagte-Klerksdorp section have been completed. In all some 22 stations have been proofed during the year. The large eastern grain area in the triangle Germiston-Witbank-Volksrust although free of plague is urgently in need of rodent proofing. Here also privately owned sheds will have to be seriously attended to. This area bears a very great similarity to the large grain area of the Orange Free State in that maize is its principal product. Sooner or later it is feared it must become plague infested.

The *Western Cape* area is of importance because of the fact that the Union Health Department has here endeavoured to preserve a plague barrier against the area north of the Olifants River and the mountain range in which it rises. Very little proofing had been previously carried out upon this system. During the year, however, a large programme was completed. In order to assist in consolidating the position of the Union Health Department, buildings on the coastal railway line north-west to Bitterfontein through the large grain districts were made rodent proof, some 23 stations and sidings having been completed. In addition some 24 stations on the main line between the Peninsula and De Doorns were proofed in order to provide against the danger of plague invasion through the Hex River Valley from the north-west. The

section of line north of De Doorns and the mountains is not quite so vulnerable as the whole of this country up to De Aar is karroo, where the domestic rodent population is small. The line from Hutchinson to Calvinia must receive early attention in view of recent human plague outbreaks along this route and of the fact that field rodents are said to enter the sheds along this line.

In *Natal* unlike most systems which make special financial provisions for rodent proofiing programmes, proofing has been carried out as a charge to the working vote. During the year 56 goods sheds and 3 meal stores were completed. Generally speaking the work involved has been on stations radiating from large centres such as Durban, Pietermaritzburg and Ladysmith. Plague is not endemic on the Natal system, but infestation of domestic rodent species is heavy everywhere both on and off railway premises. Proofing is complete and very satisfactory on the North and South Coasts from Durban. Along the latter a good deal of work was completed during the year and buildings at one time heavily infested are now in a satisfactory condition. The sheds in the harbour area are in good condition. The worst area in Durban is that adjoining Cato Creek, where depredation of rats from adjoining areas is appalling. The Department's property is now ratproof but infestation is very heavy in local drains and the new bay railway deviation bank is infested with rats. The length of this bank is about $1\frac{1}{2}$ miles and consists of loose stones which harbour rodents. It is imperative for these crevices to be filled in and cemented over before the work is completed. Over 50 rats were witnessed in procession in this vicinity during a few minutes observation in the small hours of the morning recently. Another very objectionable harbourage for rodents which forms a highway for these vermin from the town to the docks area is the present unsightly Milne drain. The continued existence of this wandering, slime-covered ditch through a town of the importance of Durban is incomprehensible. Its canalisation would remove a highly potentional source of infection of a number of diseases. Proofing work was also done in the Pietermaritzburg District and to some 20 sheds between this city and Durban. Some of the work is indifferently done, however, and a number of sheds require further attention. The programme was extended east and west of Pietermaritzburg but north of this centre the work is behindhand. The state of infestation in sheds and damage has suffered in proportion.

On the *Cape Eastern System* proofing was completed on 10 stations during the year. The north-eastern portion of the system requires early attention by reason of its adjacency to the plague areas bordering the Orange Free State. The main line is not heavily rat infested, but considerable trouble arises from micre. Stations are provided with small parcel rooms which are fairly well rodent proofed. East London and the harbour area are in need of early attention.

On the *Cape Midlands System* work is in hand at 12 stations in the vicinity of Port Elizabeth and Mossel Bay. Additional proofing at the ports should be undertaken.

On the *Transvaal Eastern System* attempts have been made to proof some 15 sheds, and improvements consisting chiefly of the replacement of wooden floors by cement, have been effected to seven sheds. Work will shortly be commenced on a larger scale for although the major portion of the system is free of plague, damage to goods by rodents is considerable. A very general improvement is hoped for in the early future.

RAILWAY VITAL STATISTICS.

Preventive measures on the railway are seriously hampered by lack of actual knowledge. Reliable statistics are available for malaria, plague and typhus fever, but birth and death rates and the incidence of infectious disease and other morbid conditions are not known.

Realising that effective prophylactic measures must be based on the local incidence of disease, arrangements were made with the sick fund and the system managers at the commencement of the anti-malaria campaign for the notification of all cases of malaria occurring in their districts.

Plague and typhus, being formidable epidemic diseases, are expeditiously notified by local authorities to the Secretary for Public Health with whom an arrangement exists to advise this office immediately of any cases which occur on or near railway property. This knowledge enables the staff to take the necessary steps to prevent their spread on or to railway premises and possible disorganisation of the service.

No information is, however, available in regard to the prevalence of other morbid conditions and it is therefore impossible to give any indication of the Railway death rate, or the incidence of enteric, tuberculosis or any other specific disease among members of the service. The absence of this

information seriously handicaps the organisation and makes it difficult to decide at what points and in which direction efforts should be concentrated to reduce morbidity rates most economically.

A speedy solution of the decided weakness is imperative. The relative figures for the various medical districts are actually in possession of the railway medical officers, and although no difficulty should be experienced in having them passed on to this office through the sick fund, representations to the Acting General Secretary to have this done have been unsuccessful.

In the meantime an effort is being made to keep a general check on these conditions by testing and improving water supplies, attending to defective sanitation and checking up on the conditions which predispose to disease. These measures, necessary as they are, are directed entirely in the dark and it is obviously impossible to determine to what extent they are successful and how far they should be modified or supplemented under the varying conditions which prevail on the railway until reliable statistics are available. Arrangements have also been made with the Catering Department for the notification of communicable diseases occuring among its staff. By virtue of this measure proper precautions are taken to ensure that members of the catering staff who are booked off with a communicable disease are not returned to duty until they are free from infection. This measure serves its purpose, i.e. safeguarding the travelling public and other members of the catering service against infection occurring among this section of the staff, but the measure does not go far enough and has little statistical value.

GENERAL.

This section of my report includes a heterogenous group of the matters which is gradually being brought under the control of the health staff. On some systems all these matters are already being dealt with, but on others the organisation has only advanced sufficiently to deal with some.

Stations Inspections.—On the Natal, Transvaal and Orange Free State systems where the organisation is better developed all stations and nearly all cottages and labourers' quarters have been inspected, reported on and improved in regard to water supply, sanitation, general cleanliness and the keeping of animals.

Water Supplies.—An adequate and wholesome domestic water supply is of the utmost importance to any community, and in this connection the Administration is faced with two distinct responsibilities each with its own problems peculiar to the working of railways under South African conditions.

It has in the first instance not only to ensure that the water supplied to the travelling public on ships, coaching stock and dining-cars is above suspicion, but that the method of cleaning and filling tanks and containers permits of no pollution. When the supplies for coaching stock are obtained from the local authority in large centres the water is usually tested at frequent intervals, but that the standard of purity cannot always be taken for granted, and that checking is necessary, is shown by the fact that the water delivered in the dock area by one of the largest corporations has not been up to standard recently and has given rise to much concern. In the event of an outbreak of a water-borne disease occurring on a ship which had taken in water at such a port the Administration as well as the local authority would suffer.

The question of cleaning and filling saloon tanks and containers in such a way as to eliminate pollution is a problem which has given rise to much thought and which has been made the subject of a special investigation by this office. It may be stated here that this part of the Administration's responsibility is rapidly being brought under proper supervision and there need be no anxiety in future in regard to supplies on trains.

Apart altogether from water used for locomotive purposes, the Administration's major responsibility is to secure adequate and potable supplies for its staff at the hundreds of stations and cottages in a country where every surface stream must be regarded with suspicion. Once pure supplies are obtained the problem is to keep them up to a definite standard. The main difficulty in connection with the purification of railway water supplies is the fact that automatic purifying plants sufficiently small to deal economically wih the amount of water consumed at an average station, have not yet been placed on the market. Small hand chlorinating plants have, however, been introduced and progress has been made in devising a suitable automatic plant. It is hoped to overcome this difficulty entirely in the near future. To rely on the average individual for the daily dosing of his water is a waste of time and material.

The Administration's water supplies are derived from a great variety of sources. When it is not purchased from local authorities it is obtained

from streams, springs, boreholes, wells or by collecting and storing rain water. At Luderitz it is distilled from sea water and at isolated stations and cottages where supplies are otherwise unobtainable it is brought by tank trucks and stored in underground concrete reservoirs or tanks.

Supplies obtained from passing trains are not only expensive, but the method involves a great deal of handling of the water and is often unhygienic. The chutes used for filling tanks are not properly handled, and badly cared for, they are left lying about on the ground and are thus liable to pollution. In most cases the tanks are not provided with taps or hand-pumps and the only possible method of withdrawing water is by dipping for it with receptacles. The risk of infecting the supply by hand or by infected containers is great and the health of the staff is endangered, especially in view of the fact that the tanks are usually left uncovered.

Considerable progress has been made on some systems in locking the tanks and in providing taps or hand-pumps for withdrawing water.

During the year the colossal task of surveying the railway domestic water supplies throughout the Union was commenced. The quality of the water is decided upon by bacteriological tests combined with sanitary inspection. The standard of jurity adopted is that accepted for the Union, i.e. No. B coli, in 10 c.c.

Although the survey is far from complete a great deal of work has been done in training the staff in the precautions to be observed in regard to water supplies, in correcting defects detected and in protecting pure supplies against possible sources of pollution at the source and during collection and storage.

The policy adopted may be briefly summarised as follows:—

(i) Routine inspection and sampling for bacteriological analysis of all domestic supplies.
(ii) Protection of all supplies against possible sources of pollution.
(iii) Replacing suspicious and contaminated surface wells by deep lined boreholes.
(iv) Co-operating with local authorities in obtaining a common safe supply.
(v) Chlorinating suspicious supplies.
(vi) Avoiding contamination from dipping in tank supplies by locking tanks and providing taps and pumps.

During 451 independent supplies were examined, 621 bacteriological and 26 chemical analyses were made at the railway laboratory, Salt River. The results of the examinations are shown in the table below. It will be observed that 70·7 per cent. of the supplies tested are pure and 10·4 per cent. are definitely contaminated. It must, however, be remembered that the suspicious and inconclusive supplies will add materially to the 10·4 per cent. (contaminated supplies). These results show that the investigation was amply justified and that there is considerable room for improvement in the Administration's domestic water supplies.

Result of Water Analyses.

System.	Number of Examinations.		Number of Domestic Supplies.				
	Bact.	Chem.	Examined.	Pure.	Contaminated.	Suspicious.	Inconclusive.
Transvaal (W)..	130	—	109	91	4	10	4
Transvaal (E)...	64	9	22	15	2	1	4
Orange Free State	102	1	89	68	2	7	12
Natal.....	64	4	57	32	11	6	8
Cape (W).....	91	3	52	41	5	6	—
Cape (N).....	80	2	55	38	12	5	—
Cape (Mid).....	12	2	9	7	—	—	2
Cape (E).....	77	5	57	26	11	14	6
South West Africa	1	—	1	1	—	—	—
	621	26	451	319	47	49	36
	—	—	—	70·7%	10·4%	10·8%	8%

Sanitation.—The following waste matters require regular removal from stations and occupied premises:—

(i) Liquid and solid excrement.
(ii) Kitchen, bathroom and bedroom slops.
(iii) Kitchen and household refuse, including garbage and ash.
(iv) Station, yard, truck and stable rubbish.
(v) Waste matter from workshops and locomotive sheds.
(vi) Storm water carrying surface washings.

In order to avoid nuisance or injury to health it is essential that these waste matters should be removed as expeditiously and disposed of as efficiently as possible. A great variety of methods exists on the railway for dealing with them. The particular method adopted at any point depends on the local circumstances. In urban areas disposal is usually carried out by the local authority at the expense of the Administration—the efficiency of the service depending on the progressiveness and the financial resources of the local authority. In large centres this usually includes up-to-date water borne sewage schemes, but the smaller local authorities commonly adopt the pail or pit system—kitchen slops being removed by tank waggon or absorbed on soakage pits, and other liquids being disposed of by surface drains or garden irrigation.

Similar methods are adopted at remote stations or in railway camps like De Aar, Touws River and Beaufort West, where local circumstances warrant this service being carried out departmentally in spite of the existence of a local authority.

Whatever method is adopted and whoever is responsible for the work constant supervision is necessary for its satisfactory performance. This is usually available at large railway depots but the amount of neglect at the average station and cottage is deplorable and here it is very unusual for the sanitary boy or gang to have any supervision.

On the better organised systems these matters are now under the direction of the health staff. Most stations on these systems have been improved by selecting appropriate disposal sites in relation to domestic offices, and by advising methods of disposal which at least meet basic sanitary requirements. Proper deep trenches or, where practicable, septic tanks are recommended in preference to depositing the nightsoil in the same open revolting pit, where the breeding of flies readily occurs and so promotes the spread of disease.

Recently Captain Otway tried out an economic and hygienic closed pit system in the tropics. A modification of this method is under trial at Heuningsspruit and at Hennenman. It is working satisfactorily and promises to reduce considerably the enormous sums of money paid out annually to local authorities for this service. It has, however, to be tried out on a more extended scale before it can be decided to what extent its adoption is possible.

In regard to slopwater it is the usual practice in urban areas where no water-borne sewage system exists to effect a daily removal of kitchen slops by tank waggon and to dispose of all other liquid waste by garden irrigation through open septic furrows, and in rural areas to discharge all waste water into the garden. These systems have many objections apart from the fact that only a comparatively small amount of liquid is removed and that in both methods the soil is rendered " sewage sick " in time.

On the railway these objections are overcome by carrying the waste water a safe distance away, in pipe or concrete drains or absorbing it in properly constructed soakage pits. In areas where the porosity of the soil makes absorption in pits impracticable, long shallow contour french drains planted with rapidly growing trees are resorted to.

There has been a notable improvement in the cleanliness of stations and railway quarters generally and in the disposal of litter and rubbish which invariably accumulates round occupied premises. Where the disposal of waste matter was undertaken departmentally reclamation by controlled tipping or incineration in properly built refuse destructors was usually advised at large depots; and shallow burial and destruction in improvised drum incinerators at smaller stations. Most large depots are now provided with proper destructors.

On the Natal sytem there are 1,578 railway quarters—206 of which are connected to municipal sewers, 98 to septic tanks, 1,261 are on a pail, 10 on a pit and 3 on a patent waterless (Hill) system.

The total amount paid by the Administration annually to local authorities (Durban, Pietermaritzburg and Estcourt) for the use of town sewers is £4,144. 10s. and to other local authorities for sanitary service £3,105. 3s.

By virtue of the better organisation, the closer supervision and the greater experience of the field staff on this system, the men are now handling all the phases of health work they were intended to undertake, and there has been great improvement not only in anti-malaria and anti-rodent work but also in general sanitation and other matters related to health.

The most notable improvements are:—

(i) Improved methods of night soil disposal especially on District 3.
(ii) Improved methods of liquid house waste disposal throughout the system by more frequent use of absorption pits or French drains.

(iii) Improved methods of disposal of refuse.
(iv) Improved fumigation.
(v) Improved housing conditions for natives.

In connection with the last, brick barracks to replace wood and iron have been built at Kelso Junction, Umgababa, Umzinto and Estcourt. New European houses were built at Umgababa and Ottawa to replace condemned quarters and composition (asbestos and brick) houses were built at Gollel and Mkuzi.

Fumigation.—Formaldehyde disinfection was undertaken by the sanitary foreman on the section in cases of infectious disease and cyanide fumigation for vermin. Instead of repeating the process 10 days later as was customary, a slightly higher concentration of gas to kill eggs, larvae and adults in one operation was adopted. This method is giving excellent results. During the year 162 fumigations were done on the system.

Durban Workshops.—Following on representations by the artisans employed in the Mechanical Engineer's Shops and in the Greyville Running Sheds regarding the deplorable state of sanitation and the conditions of the shops generally, the matter was investigated and among the recommendations put forward were the establishment of a properly organised sanitary gang under a sanitary foreman and improved washing, eating and dressing facilities all under the control of the Assistant Engineer (Drainage and Sanitation). The work was commenced at the beginning of May and judging from the results to date including the satisfaction of the staff and their co-operation with the sanitary foreman in charge, was fully justified and promises to be entirely successful.

Model Villages.—During the year the Administration's policy of providing decent housing facilities for married European labourers and their families employed on major construction operations was commenced. The first model village consisting of 100 wood and iron insulated houses and accommodating 400 men, women and children was built about 2 miles from Ingogo station. Commensurate with the funds available no effort was spared in providing all the amenities of life which direct towards health, comfort and happiness.

The village was properly planned and is ideally situated for natural drainage on 65 acres of ground against a sloping hillside at the top of a valley. The houses are three and four roomed, 16 ft. by 12 ft., with a kitchen 12 ft. by 12 ft., fitted with coal stoves. Each house is situated on a fenced-off plot 100 ft. by 75 ft. Pure spring water is laid on to each and the residents are encouraged to cultivae the plots. The streets have been planted with jacaranda trees 8 ft. to 10 ft. high.

A fly proof pit sanitary system has been adopted and communal bathrooms, separate for the sexes, and wash houses have been provided. Household refuse is disposed of by incineration and liquids by absorption pits.

The public buildings such as hall, school and dispensary are centrally situated and are easily accessible.

A resident nurse has been appointed and a doctor visits the village twice weekly, and the affairs of the camp, including its hygiene are administered by a superintendent. Servants and unauthorised visitors are not allowed and the keeping of pigs, goats and cattle is prohibited. Intoxicating liquor may not be brought into the village, debt is discouraged and the rules provide for the regular attendance of children at school and at parade on Saturday mornings. The scheme has proved an entire success and the experience gained in establishing this village will be applied at Mount Prospect where it is proposed to erect a second, larger and improved edition.

The personal effects of residents were fumigated on arrival before admission into the village. The incidence of sickness has been negligible and infectious disease has been entirely absent. One imported death and 8 births occurred, and the wastage of labour has been 2 per cent. since the establishment of the village.

Great improvement has been effected on the two Transvaal systems, especially in regard to improved methods and sites for depositing solid waste matter and in the safer disposal of liquid waste in absorption pits or by better systems of drainage, but the condition of housing in the bigger centres is far from satisfactory.

On the Transvaal Western system there are 1,995 railway houses, 290 of which are connected to town sewers, 13 are on a vacuum system and the remainder have a pail service.

The total amount paid annually by the Administration for the use of Johannesburg municipal sewers is £4,557 and for sanitary services to other local authorities £7,006. 17s.

Work in connection with the installation of sewerage to all railway quarters (151 houses) at Germiston is progressing favourably and should reach completion within the next twelve months. The sewerage at the native compounds, goods sheeds and goods offices has already been completed and is waiting on the municipality. Extensive improvements were carried out to slop water drains at Volksrust, Bethal and Potchefstroom. At the last mentioned station the slops are discharged into municipal vacuum tanks and at Volksrust steps are now being taken to introduce a water borne sewage system by means of a vacuum system.

The majority of quarters on this system are in a good state of repair and few complaints have been received from tenants. There are still, however, some arrears of renovation to be undertaken. The two works inspectors have drawn up a programme for the renovation of quarters and each station is receiving attention in turn. At Volksrust 22 houses are being provided with brick pantries and bathrooms. The installation of hot water systems in houses occupied by graded staff is progressing at the average rate of four per month. This facility is greatly appreciated by the staff but there is still a large number of houses where it has not been provided.

At Braamfontein 37 houses are being demolished. These are being replaced by 34 new brick buildings at Langlaagte and 3 at Braamfontein. In Germiston 53 new brick houses are in the course of erection for European labourers to replace the dilapidated wood and iron structures known as " Tin Town ". Fifteen of these houses have already been completed.

The Administration has also sanctioned funds for the erection of 21 new houses at out stations, a block of brick restrooms at Bethal and another at Balfour North. This is only a small proportion of the quarters required on this system.

On the Transvaal Eastern system there are 1,556 railway houses of which 684 have a municipal service and 872 a departmental service. 278 Houses are sewered, 13 are connected to septic tanks and the remainder are on a pail system.

The total amount paid annually to Pretoria Municipality for local sewer rates is £3, 630. 10s. 6d. and to other local authorities for sanitary service £3,201. 4s.

Pretoria, the largest railway centre on this system has 278 houses all on water-borne sewerage. Receptacles are provided for household refuse pending removal by the local authority but these are heavy and untidy and not provided with lids. The camp is attended by a gang of European labourers and the compound by a gang of natives under the supervision of the compound overseer. The general cleanliness and the rubbish disposal system in the European and non-European sections of the camp should be improved. Now that a camp overseer has been appointed better conditions should prevail.

A number of quarters fall below the legal standard and as this is one of the eight cities where the Slums Act is enforced the question of providing better housing will have to be considered at an early date.

The additions to some standard buildings in the railway reserve have reduced light and ventilation in the houses below the legal standard. Such alterations are by no means improvements and should under no circumstances be permitted.

The village of Waterval Boven is essentially a railway camp where no local authority exists and where the affairs of the camp, including its hygiene, are entirely under the control of the Administration. The total European and native population is over 2,000. There are 173 European houses, with a list of 41 families unprovided with accommodation. The condition of houses has greatly improved and six new brick buildings were erected during the year but in spite of this the waiting list is steadily increasing every year. It has nearly doubled itself during the last three years and the shortage of quarters is rapidly becoming intolerable.

The restrooms are connected with a septic tank. All other quarters are on a daily pail service. The pails are properly cleaned and disinfected but there is room for improvement in disposal. This service is carried out by a gang of 16 natives under the control of a native boy. Household refuse is collected in suitable receptacles but it is unsatisfactorily disposed of by dumping. Kitchen slops and other liquid waste are carried away by a system of open concrete drains which are kept clean by a gang of 6 natives under the control of a squad ganger who also attends to the general cleanliness in the camp.

Water is obtained from the Elands River. It is pumped to a 750,000 gallon open concrete reservoir where suspended matter is coagulated by lime

and alum and allowed to settle. The water is clarified by passing through a new type of sponge filter and chlorinated by an automatic chloronome before passing into the service reservoir.

This plant has been in operation since the early part of last year and is giving entire satisfaction. No cases of water borne disease have occurred in the camp since its installation.

An abattoir has recently been erected, but the railway community which it serves has no control over the condition of the animals slaughtered nor of the meat sold in the camp, and there is no control of the milk supply. These facts, together with the size of the camp and its rapid growth, the prevalence of malaria, the water purifying plant, the defective sanitation and lack of cleanliness all warrant the appointment of a sanitary foreman to take charge of these matters instead of a squad ganger.

On the Orange Free State system there are approximately 2,000 railway quarters, of which 368 are situated in Bloemfontein and are on water-borne sewerage. The remainder are distributed throughout the system and are on a pail system—the principle of local authorities effecting removals being adhered to. Approximately £6,978 are paid annually by the Administration for this service.

During the year an improved sewerage scheme costing £3,616 was commenced for Bethlehem and should be completed within this financial year. A sum of £25,000 was also sanctioned by the Administration for sewerage at Kroonstad. At both places there is an urgent need for improvement and once these works are completed the majority of quarters on this system will be adequately served.

The condition of housing is far from satisfactory, and although station hygiene has improved, it still leaves much to be desired. The latter weakness is attributed to the fact that the improved organisation on this system is young. Plague and typhus constitute the major problems and occupy a similar position on this system as malaria in Natal and the Eastern Transvaal. With the unusual rodent prevalence and the numerous typhus and plague outbreaks this year it would have been unsound policy to divert the attention of the field staff to matters of a less urgent nature.

During the year 37 houses were fumigated, 6 French drains and 7 pipe drains were installed. Six learners were trained in anti-rodent work on this system.

Keeping of animals on railway property and vending of milk.—The keeping of cattle, goats, pigs and poultry on railway premises especially in congested areas is a problem which presents many difficulties from a hygienic economic and social point of view. Apart from the nuisance which arises from inadequate housing and slovenly keeping of animals fly breeding is enhanced and the spread of fly-borne and other communicable diseases is promoted. This is especially the case where milk and other dairy produce are sold from such premises and where cattle and pigs are allowed to roam at large and become infected with helminth conditions.

The keeping of pigs cannot be permitted, but it is realised that a cow or a milk goat means a great deal to a European labourer or other lowly paid employee. Unfortunately it is precisely this class of employee who cannot afford to house and keep animals to the best advantage.

The general policy where no milk is sold, is not to increase hardships by demanding an excessive standard but to advise, as far as possible, simple and practical methods within the financial means of the employee and yet meeting basic sanitary requirements. With this object in view tenants are permitted to keep animals where the space allows, but stables must be kept clean, drained and aired, droppings collected and either buried daily or stored in proper fly-proof receptacles until it can be safely disposed of.

Where, however, milk is sold by the employee's dependents a much higher standard of dairying hygiene is required and a certain proportion of the income derived from this business must be invested in improved stabling and in the handling of milk. Finally in places adjoining urban local authority areas the local by-laws are expected to be complied with in regard to dairying and the keeping of animals generally.

Catering hygiene.—Whilst the personal cleanliness of its catering staff has at all times been of first consideration to the Administration, the question of the Department's responsibility towards protecting members of the travelling public from the risk of communicable or infectious disease was in the past a difficult matter to cope with. The main reasons for this were due to the limitations imposed by legislation and the necessity for having departmental medical advice in connection with staff matters. As a first measure it was therefore highly desirable to adopt some general method for minimising the risk of spread of infection by carriers and by saloon water as a medium of infection.

Watering of trains and dining cars.—It is necessary to set a high standard of cleanliness in the handling of water, equipment and utensils. This matter is receiving attention. It is of paramount importance that the water to dining cars should be unquestionable and whilst improved methods of cleaning and filling tanks are insisted upon, the question of rendering these supplies sterile by chloramine tablets is also under consideration. If there is the least doubt about obtaining the desired standard of purity by improved hygiene, chlorination will be resorted to. There will, therefore, in future be no occasion to regard dining car water or water in saloon filters with any suspicion.

Carriers of infectious disease.—Owing to protracted laboratory investigation the recognition of carriers is a costly and lengthy process. It was, however, recognised that a start must be made somewhere. Accordingly the Catering Department was requested—

(1) to ascertain what members of the staff had at any time suffered from enteric, dysentery, and the food poisoning group of diseases and thereafter to eliminate possible carriers of infection by a blood examination and laboratory tests;

(2) to have all entrants into the Service via the Special Service Battalion put through exhaustive medical tests to preclude the possibility of carriers being admitted to the Service from this source.

The enquiries under (1) are still being carried out whilst the arrangements under (2) will continue. The combined measures form a very practical commencement of the discharge of the Administration's responsibility towards the hygiene of the service given to the travelling public.

Apart from carriers of the above diseases, the risk of communicating infectious diseases to members of the public by the catering staff is very small. At the same time such is the march of progress that some large catering services of the world in an endeavour to reach the acme of perfection in service to their clients are now including a periodical medical examination of their staff as a routine.

Quite apart from the desirability of such examinations the proposals as applied to South Africa bristle with difficulties, one being the matter of legislation. The Public Health Act makes it an offence for persons suffering from infectious disease to handle food or food utensils. Although the Act throws the responsibility equally upon the employer and employed there is no machinery for legalising the compulsory medical examination of staff at regular intervals, but the Minister may agree to the examination of the staff if any special circumstances would appear to warrant such a course.

This difficulty has been overcome to a large extent by providing for the close co-operation of the catering staff office with the Railway Health Officer. The latter is now advised of all cases of infectious disease amongst the staff and precautions are taken to ensure that the staff is free from infection before they are booked on duty again. Should it at any time appear that circumstances demand it an examination of the whole or any particular section of the staff may be called for.

During the year a new perishables food store has been provided at the Braamfontein depot. This has been planned on the most modern lines and is a great improvement. At the same time methods of victualling dining cars and bedding and de-bedding of trains throughout the various depots call for considerable improvement and in the near future will have to be re-planned. The supervision of all food depots from a hygiene point of view will now be undertaken by the health staff.

Under the recent general investigation into the catering service the question of bedding has received consideration and, owing to the lack of facilities and space at the Capetown depot recently brought to notice, new and adequate accommodation and equipment are being provided at this centre.

Railway Housing.—The housing of railway employees in South Africa is a side of the Administration's responsibility which received a bad start from its inception. In the first place the rigours of this climate are not so extreme as we meet with in other parts of the world. There are no parts of the country where rain and bitter cold drive the whole family indoors for months at a stretch. The genial climate combined with the warm sunlight to which we all look as a matter of form has had the effect of causing us to construct unsuitable places of abode for our employees and to divert the financial difference to more pressing business developments. A further reason for the mediocrity of railway housing, with special reference to large centres and railway camps, is that the majority of houses were erected at a time when there was only one object in view, i.e., the necessity to have employees resident at such centres to fill the needs of railways, and they

could not be stationed there without providing accommodation to live in. This was regarded as an evil responsibility from which there was no escape for the Administration, as at the time no Housing Act existed and no Government funds were available to local authorities for housing purposes even if the fantastic idea of borrowing money for the purpose had occurred, to them. At other places no local authority existed. There was further no co-operation between Government Departments and local authorities in matters where the functions of the two overlapped, so that the feeling which generally prevailed where the Government imported any large body of labour to a centre was one of " You brought them here, you provide for them ", owing, no doubt, to the mistaken impression that railways paid no rates and should, therefore, not be entitled to drain the communal facilities provided at the expense of other ratepayers.

The present goodwill towards employees did not exist. As a result any type of house was considered good enough, especially in view of the fact that housing of employees was not a revenue producing side of railways.

No housing legislation existed and the constant demand on the part of the public for more and more railway development out of the limited funds available made it inevitable that railway housing should suffer.

In the early days of railway development very little progress had been made into scientific town planning and as a result any communal domestic lay-out followed the practice adopted in large industrial railway centres in Europe, where space was at a high premium. In any case the houses, being intended purely for use, and not as ornaments to their locality, were erected without considering such amenities of life as charm of environment, health of locality or attractiveness of surroundings, and any attempt at site planning would have been a travesty and considered a waste of time. In spite of an abundance of cheap or entirely free land the aspect and choice of site were given little attention.

Wood and iron structures, owing to cheapness and easy portability, were greatly favoured. Many of these have since disappeared, but far too many have remained behind under the guise of permanent and satisfactory structures after having been partially remodelled by addition of brick interiors or brick jackets.

Back-to-back quarters erected without regard to light and ventilation, still stand as examples of the bad type of buildings erected in those days. A further example of inadequate housing is the unsatisfactory small type lacking many conveniences of a home and making no provision for the growing family and constantly requiring additions and alterations, but departing further and further from modern housing standards.

The foregoing briefly reviews the policies of the times and the atmosphere under which our housing system was evolved. Happily, since the conclusion of the Great War, the opinion of the world has changed in regard to housing. Town-planning began to be studied in regard to the position of residential areas in relation to open spaces, industrial sites, public buildings and business premises; the architecture of dwellings became a science, and above all the pride of ownership or tenancy has spread to the individual and in all circles high and low a man's dwelling and surroundings have become universally as important to look at as to occupy.

Governments, local authorities and large employers of labour are now agreed on the influence of the home on the workman and that better and more work is obtained from men living under satisfactory conditions than when the greater part of their existence is passed in uncongenial and unhealthy surroundings.

The attitude of the whole world is one of toleration and assistance towards providing people with all the amenities of life commensurate with funds available, and the total abolition of those conditions which make for slums and overcrowding, where decency and morality are impossible, where mass spray infection in confined atmospheres, mass infection from vermin, dirt of person, clothing, bedding and surroundings are important factors in undermining the health of the people and in promoting the spread of disease.

South Africa has not been slow in adopting this new outlook. The Slums Act, recently passed by Parliament and enforced in the eight large local authority areas and made optional for other centres provides the necessary machinery for ameliorating living conditions.

The Railway Administration, as a Government Department, as the largest employer of labour and the largest owner of houses in the country cannot afford to ignore this new outlook especially in view of the fact that it is responsible through its medical and health services for the health of approximately one-tenth of the total European population of the Union. There is every sign that it is prepared to move with the times. A Housing

Committee has already been appointed and is inquiring into the various phases of railway requirements. Their terms of reference include—

(*a*) the adequacy or otherwise of housing accommodation available for railway and harbour servants in the towns, townships and railway depots of the Union and the extent of the housing shortage if any;

(*b*) the extent to which local authorities are prepared to co-operate with the Government in providing municipal housing accommodation for the tenancy of railway servants where they are unable to secure suitable accommodation within their means;

(*c*) to decide upon a Departmental housing programme including the needs of the immediate present and the future;

(*d*) a study of the types of houses suitable to various localities and building costs;

(*e*) the condition and suitability of existing quarters and what improvements are necessary thereto;

(*f*) living and communal service conditions in railway camps and what improvements are considered practicable and desirable;

(*g*) all other matters affecting living and housing conditions that may come to notice during the investigation.

The investigation is being conducted by two of the Administration's senior officers who have the right to call for statements not only from the members of the staff and their families stationed in various parts of the country, but the technical advisers and senior officers of the Department who are responsible for the phases of the work of housing provision. This will enable every view point of the subject to be reviewed in a way that has not been possible on any previous occasion and will, it is hoped, indicate the desirability for an immediate programme of improvement and the comprehensive scheming of all future housing requirements.

Special Investigations.—The following investigations were made during the year at the request of the general manager or system manager concerned. Most of these matters have been referred to in the body of the report.

(*a*) Working conditions—Grain Elevators.

(*b*) Working conditions—Mechanical Worksshops, Durban.

(*c*) The metallic dust and sun glare nuisance to drivers on the Cape Suburban Electrified section.

(*d*) Native and coloured housing, Naauwpoort location.

(*e*) Lead poisoning in brass foundry, Durban workshops.

(*f*) Hot firebox repair work, locomotive depots.

(*g*) Watering arrangements at depots for saloons and dining cars.

(*h*) Office accommodation, Customs House Block, Capetown.

(*i*) Sewage and slop-water disposal, Kroonstad quarters.

In addition, a number of minor investigations were made on behalf of the sick fund and consultations given to the general manager's office in connection with staff practice.

During the year two complaints of alleged food poisoning were reported by passengers to the catering department, and to safeguard the position of the Department it was considered advisable to have the food complained of analysed. In both cases the food was found to be free of any irritant or foreign matter.

ANNEXURE E.

TABLE 2.—VACCINATION OF INFANTS AND CHILDREN IN THE CLASSES OF THE POPULATION WHICH REGISTER BIRTHS, YEAR ENDED 30TH JUNE, 1935.
(These figures do not include Re-vaccination of the 12-year old Children.)

Particulars.	Cape.		Transvaal.		Natal.			Orange Free State.	Union.
	Cape District.	Remainder of Province.	Rand Area.	Remainder of Province.	Durban.	Pieter-maritzburg.	Remainder of Province.		
Births Entered in Vaccination Register	13,291	36,311	10,794	11,324	2,201	673	1,625	4,740	80,959
Successfully Vaccinated	4,698	7,114	4,440	6,105	1,017	380	1,066	2,477	27,297
Insusceptible to Vaccination	9	19	66	67	84	10	22	31	308
Vaccination Postponed owing to Illness	172	268	1,182	859	351	115	455	938	4,340
Previously had Smallpox	2	—	—	—	—	—	—	—	2
Deaths of Infants under Two Years Registered	3,203	3,138	716	488	185	37	107	214	8,088
Exempted under Section 10, Act No. 15 of 1928	28	61	158	137	16	33	64	81	725
Ratio Percentage of Vaccinations Registered to Births Registered during the Year (after allowing for deaths of infants under two years)	46·6	21·4	44·1	56·3	50·4	59·7	70·2	54·7	37·5

ANNEXURE E (*Continued*).

TABLE 3.—RE-VACCINATION OF TWELVE-YEAR-OLD EUROPEAN CHILDREN IN NATAL, YEAR ENDED 30TH JUNE, 1935.

Particulars.	Durban.	Pieter-maritzburg.	Remainder of Province.	Total.
Registration of twelve-year-old European children	1,293	456	1,217	2,966
Successfully vaccinated	984	319	923	2,226
Insusceptible to vaccination	122	15	107	244
Vaccination postponed owing to illness	51	30	70	151
Previously had smallpox	—	—	—	—
Ratio percentage of vaccinations to twelve-year-old registrations	76·1	70·0	75·8	75·1

ANNEXURE F.

THE SOUTH AFRICAN MEDICAL COUNCIL.

RÉSUMÉ OF BUSINESS FOR THE YEAR ENDED 30TH JUNE, 1935.

The ordinary half-yearly meetings of the Council were held as well as several meetings of the various standing committees. During the year the following registrations were effected:—

125 Medical practitioners, 21 dentists, 185 medical students, 4 dental students, 415 nurses, 283 midwives, 1 masseur and 4 dental mechanicians. Of the nurses and midwives registered, 365 of the former and 264 of the latter had obtained certificates of competency by passing the Council's examinations. The number of persons whose names appeared in the various registers on the 30th June, 1935, was as follows:—

Medical Practitioners	2,659
Dentists	726
Medical Students	936
Dental Students	33
Nurses	5,359
Midwives	3,399
Masseurs	39
Dental Mechanicians	119

Examinations for nurses and midwives were held half-yearly. The table below shows the number of candidates who presented themselves for the various examinations and the number who passed:—

		Presented.	Passed.
Medical and Surgical Nurses	Preliminary	478	380
	Final	287	286
Male Nurses	Preliminary	22	12
	Final	9	7
Mental Nurses	Preliminary	115	90
	Final	71	48
Nurses for Mental Defectives	Preliminary	38	29
	Final	35	23
Midwives		299	264

In the last report reference was made to the issue of distinctive badges to nurses, midwives and masseurs. It is a matter for regret that up to the present the demand for these badges has been comparatively small.

A deputation from the Council waited on the Johannesburg Hospital Board to urge upon that body the advisability of training non-European nurses in the non-European hospital so that they could ultimately qualify as medical and surgical nurses and be registered as such. The Board has since advised the Council that it is not prepared to depart from its previous decision on the question, viz.:—

> "That the time is premature and it is not in the interests of the native sick to train native nurses for the South African Medical Council's examinations for Trained Nurses."

The Board, however, adds that it is prepared to give the matter further consideration next year.

The Council has had under consideration for some time past a scheme for giving recognition to part of the training of pupil nurses in smaller hospitals in the Union. As, however, there appeared to be a conflict of opinion as to the advisability of the proposals it was decided to submit them for the views of the medical officers and matrons of all hospitals. Circulars to the number of 220 were sent out and only 11 replies were received. Under these circumstances the Council decided to abandon the scheme as it realised that its success depended upon the whole-hearted co-operation of the hospital staffs.

On various occasions examiners have reported that, owing to the low standard of education required of pupil midwives, many of the candidates were unable to express themselves correctly in reply to the questions which were put at the examination. The Council, therefore, resolved to raise the standard from Standard VI to Standard VII; the resolution was approved by the Minister of Public Health and the necessary amendment of the rule has been promulgated.

During the period under review inquiries have been held under the Council's disciplinary powers into the conduct of six dentists and one medical practitioner. One dentist was acquitted, and the others found guilty of the charges preferred against them: of the latter two were cautioned, one reprimanded and cautioned under the hand of the President, one sentenced to three months and another to six months suspension from practice: the medical practitioner was severely reprimanded and cautioned. The dentist who was sentenced to six months suspension from practice made an application to the Supreme Court for review of the proceedings: the Court, however, declined to interfere with the Council's decision and the application was dismissed with costs.

Reference was made in the last report to the non-recognition by the General Medical Council of Great Britain of diplomas in Public Health granted by South African medical schools. A letter has since been received from the General Medical Council saying that the Privy Council has been approached with the view to the introduction into Parliament of legislation so as to enable diplomas in Public Health granted in any part of His Majesty's dominions exclusive of the United Kingdom, to which Part II of the Medical Act, 1886, applies, to be considered on the same footing as diplomas in the United Kingdom.

During the last session of Parliament, Act No. 2 of 1935, being an Act to amend the Medical, Dental and Pharmacy Act, 1928, was passed by the Legislature. This Act will considerably facilitate the conduct of disciplinary inquiries for, whereas in the past no finding of a committee was of effect until confirmed by the Council, the amending Act gives a committee power to impose a caution or a reprimand or a reprimand and a caution without reference to the Council. A person accused of improper conduct may be informed immediately of the committee's decision if one of the above penalties is imposed instead of having to wait some months until a meeting of the Council is held.

Another important provision is made in the Act, this being that conditions or requirements may be prescribed in regard to the recognition of degrees, diplomas or certificates. This was found necessary for, as stated in the last report, the prescribing of such conditions was found to be *ultra vires* the Principal Act. The Council proposes, subject to the approval of the Government, to impose a condition on the recognition of all medical degrees, diplomas or certificates on similar lines to those existing in regard to degrees of South African medical schools, viz. that the last three years of professional study must be taken in the medical school granting the degree.

ANNEXURE G.

THE SOUTH AFRICAN PHARMACY BOARD.

Résumé of Business for the Year Ended 30th June, 1935.

The usual half-yearly meetings of the Board were held in July, 1934, and January, 1935, and, in addition, three special meetings were held besides several meetings of the standing committees.

During the period under review the registration of 42 chemists and druggists, of 30 managing directors of companies carrying on the business of chemists and druggists, and of 36 apprentices was effected. Of the persons registered as chemists and druggists five held the certificate of the Pharmaceutical Society of Great Britain, their registration being effected by virtue of the reciprocity agreement entered into with that body, and one held the Approbation als Apotheker of Germany, his registration being effected under section 99 (8); the remainder held the qualifying certificate of the Board. On the 30th June, 1935, the names of 1,284 chemists and druggists, 116 managing directors, and 227 apprentices appeared in the Board's registers.

Examinations were held in December, 1934, and June, 1935. The tables show the results:—

Preliminary Scientific Examination.

	Number of candidates examined.	Passed.	Failed.	Referred.		
				Botany.	Chemistry.	Physics.
Whole examination.....	103	28	49	10	7	9
Botany only.....	18	13	—	5	—	—
Chemistry only.....	13	11	—	—	2	—
Physics only.....	1	1	—	—	—	—
	135	53	49	15	9	9

Qualifying Examination.

	Numbe rof candidates examined.	Passed.	Failed.	Referred.		
				Chemistry.	Pharma-eognosy.	Dis-pensing.
Whole Examination.....	83	21	26	14	—	22
Chemistry only.....	16	2	—	14	—	—
Dispensing only.....	29	14	—	—	—	15
Pharmacy only.....	1	1	—	—	—	—
Pharmacognosy only.....	1	—	—	—	1	—
	130	38	26	28	1	37

Note.—Candidates for examination in only one subject were previously referred for further study in that subject. By passing in that subject they are accepted as having passed the whole examination.

The Board desires to maintain a high standard of training and examination for chemists and druggists and has, therefore, appointed a sub-committee to revise the present syllabus for the examinations. This sub-committee has already given a considerable amount of time to the subject but its labours have not yet concluded.

Complaints as to professional misconduct of chemists and druggists have again, it is pleasing to report, been few and most have been of a minor nature. In one case the Board held an inquiry as provided by Chapter IV of the Act and the chemist complained of was found guilty of conduct which, when regard was had to his profession, was improper. He was sentenced to a reprimand and caution under the hand of the President.

The manner in which habit-forming drug registers are kept has been a matter of adverse comment not only by inspectors appointed by the Department but also by those appointed by the Board to inspect pharmacies where it is proposed to employ an apprentice. The Board has, therefore, prepared, for submission to the Department, a form of habit-forming drug register to be kept by all chemists and druggists.

The existing regulations for the keeping, sale and supply of poisons have been found wanting in many respects. The Board has, therefore, drafted amended regulations—those in relation to agricultural poisons in collaboration with the Department of Agriculture and Forestry—and submitted them to the Department of Public Health for approval.

RELATIVE INCIDENCE OF LEPROSY IN STANDARDISED NON-EUROPEAN POPULATION FOR THE PERIOD 1901-1930

UNION OF SOUTH AFRICA

NOTE

Each dot represents one certified case per 1,000 of population where the population is standardised to 1,000 non-Europeans per 100 sq. miles

0 10 20 30 40 50 100 150 Miles.

Territorial Boundaries ... ...

Provincial Boundaries ... ...

District or Divisional Boundaries ... ...

Principal District Town ... ...

Railways ... ...

BECHUANALAND PROTECTORATE

Tropic of Capricorn

SOUTH WEST AFRICA

RHODESIA

PORTUGUESE EAST AFRICA

ZOUTPANSBERG

PIETERSBURG

LETABA

PILGRIMS REST

BUSTENBURG

MARICO

TRANSVAAL

PRETORIA

NELSPRUIT

MAFEKING

VRYBURG

KRUGERSDORP

VEREENIGING

SWAZILAND

KURUMAN

GORDONIA

KLERKSDORP

VREDEFORT

FRANKFORT

HEILBRON

INGWAVUMA

TAUNG

KROONSTAD

LINDLEY

RENTZ

STATE

NEWCASTLE

VRYHEID

UBOMBO

NGOTSHE

BARKLY WEST

HOOPSTAD

HARRISMITH

DUNDEE

NATAL

KIMBERLEY

ORANGE FREE STATE

WINBURG

FOURIESBERG

KEI RIVER

HLABISA

KENHARDT

HERBERT

LERIBE

UMVOTI

ESHOWE

NAMAQUALAND

PRIESKA

HOPETOWN

FAURESMITH

BASUTOLAND

MACHACHES NEK

INANDA

PORT NOLLOTH

PHILIPSTOWN

BRITSTOWN

CARNARVON

WILLISTON

CALVINIA

HANOVER

VICTORIA WEST

RICHMOND

MIDDELBURG

ALBERT

VAN RHYNS DORP

CAPE OF GOOD HOPE

FRASERBURG

MURRAYSBURG

GRAAFF REINET

QUEEN TOWN

CLANWILLIAM

SUTHERLAND

BEAUFORT WEST

ABERDEEN

PEARSTON

PIQUETBURG

CERES

LAINGSBURG

PRINCE ALBERT

WILLOWMORE

JANSENVILLE

EAST LONDON

STEYTLERVILLE

MALMESBURY

LADISMITH

OUDTSHOORN

UNIONDALE

ALEXANDRIA

BATHURST

PORT ALFRED

GEORGE

KNYSNA

HUMANSDORP

PORT ELIZABETH

MOSSEL BAY

CAPE TOWN

SWELLENDAM

RIVERSDALE

CALEDON

BREDASDORP

ATLANTIC OCEAN

INDIAN OCEAN

Drawn in the Geological Survey Office

Hoho zincographed at the Government Printing Works, Pretoria